The IRON AGE
June 12, 1958 A Chilton Publication The National Metalworking Weekly

Is Automation Stunting Union Growth? P. 41

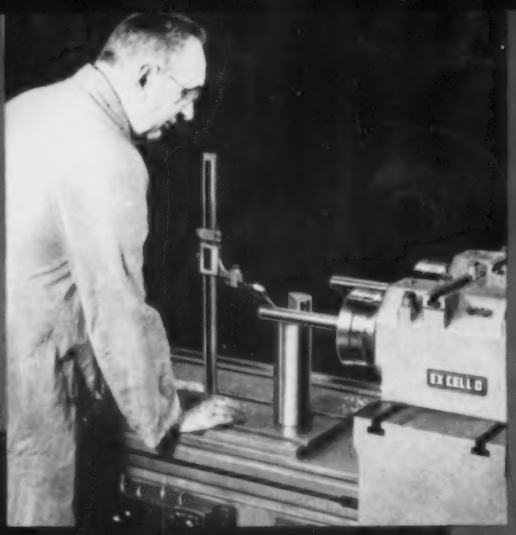
Close Inventory Control Can Pay Dividends – P. 46

Die Bank Cuts Stamping Costs – P. 83

Digest of the Week P. 2-3

XLO

EX-CELL-O
FOR PRECISION



The same skill, care and precision that goes into the building of a new machine is duplicated in renewal or repair of older machines by the men who know Ex-Cell-O Precision Machines best.

58-39

Are you ready for the business upsurge?

RENEW YOUR EX-CELL-O MACHINES NOW!

Better business is just around the corner, and now's the time—when your present Ex-Cell-O equipment may not be in continuous service—to release idle machines for renovation before full production begins once more.

Ex-Cell-O's facilities for machine repair or renewal are geared to your specific needs—whether it's a planned modernization program or an emergency repair job. The service is fast, the workmanship thorough; and, of course, necessary replacements are Ex-Cell-O "original equipment" precision parts.

For complete satisfaction and guaranteed results, put your Ex-Cell-O machines in the hands of the men who know them best. Contact your local Ex-Cell-O Representative, or call direct for complete details.

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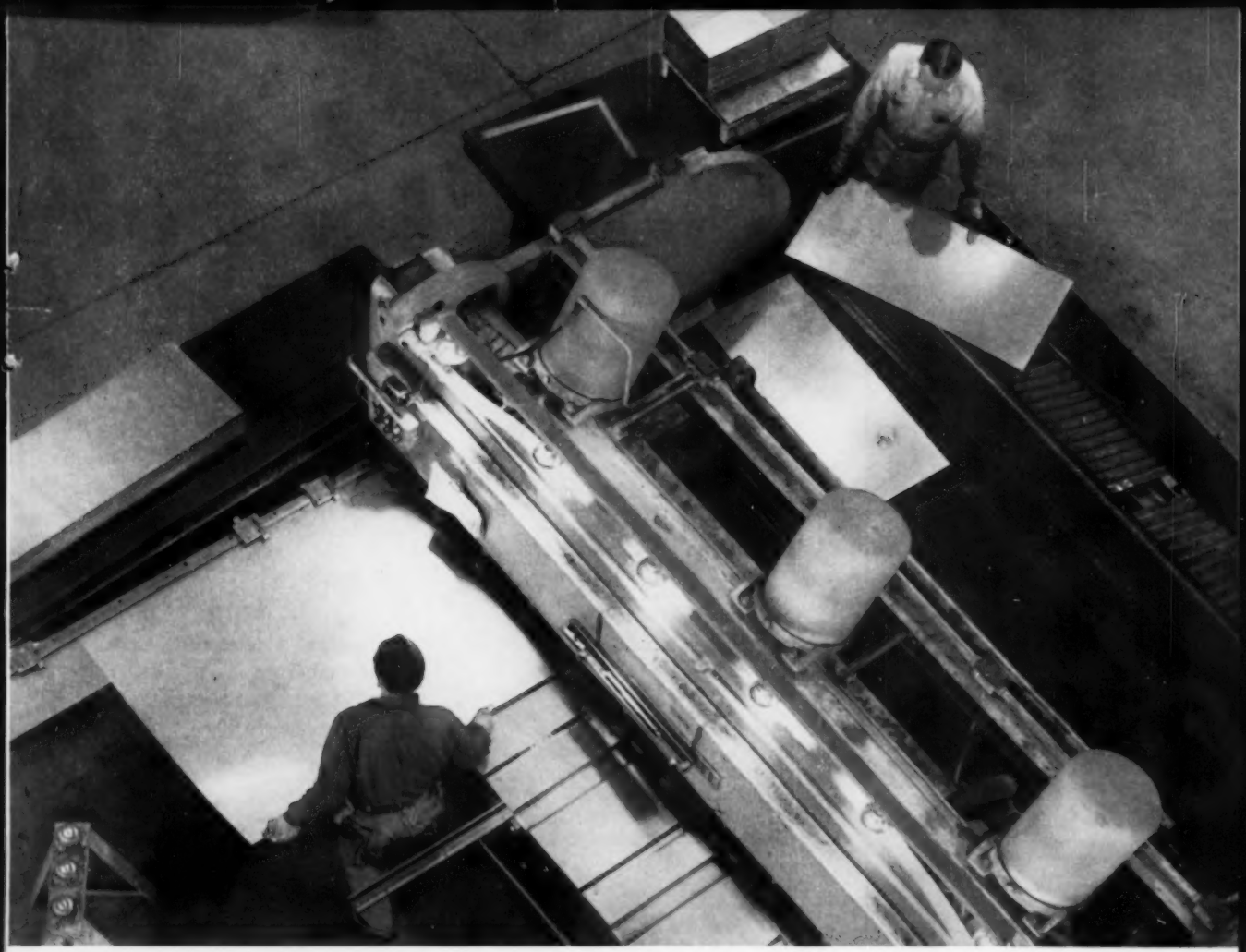
MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT



Bethlehem distributors are equipped for such services as cutting, slitting, sawing, testing.

"We Rely Heavily on Local Distributors"

Phillips B. Hoyt, ACF's Vice-President in Charge of Purchases, and scale model of sample car built for the Bangor & Aroostook.

Before producing an order of freight cars for a customer, American Car and Foundry, Division of ACF Industries, Inc., normally builds a full-sized prototype, or sample. This sample car is inspected and thoroughly checked by ACF itself and by the customer's officials.

From local sources come many items used in the building of the prototypes. "For example," says Phillips B. Hoyt, Vice-President in Charge of Purchases, "we rely heavily on local distributors for the steel structurals, hot-rolled sheets, and bars used in producing our sample cars. In addition, MRO items for cars in service are made from warehouse steel, so that prompt deliveries are always possible."

As usual, American Car and Foundry drew from distributor stocks when building a recent sample car for the Bangor & Aroostook. Early completion of the sample was aided by the distributor's quick delivery of structurals, sheets, and bars.

HERE'S WHAT THE DISTRIBUTOR OFFERS YOU. Bethlehem sheets, bars, shapes, plates, tool steel, and other steel products are available through distributors from coast to coast. Stocks are carefully selected to meet the needs of the local areas served. But the distributor offers you more than a warehouse full of steel. He's equipped for such services as slitting, sawing, flame-cutting, testing. And you can rely on his deliveries!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Bethlehem Pacific Coast Steel Corporation, San Francisco

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THE IRON AGE
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The IRON AGE

June 12, 1958—Vol. 181, No. 24

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AUTO LABOR

No Contract — UAW's delaying tactics to hold off a strike until fall have run into trouble. Problems of working without a contract cropped up almost immediately. More trouble apparently lies ahead. P. 48

POWER

Project EHV—General Electric will construct prototype high-voltage power line capable of transmitting 750 kv, highest in the world. It is expected to result in a high voltage power network. P. 45

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Customer Is Right—To bring its

Metalworking

products up to date, Erie Foundry went directly to its customers and asked them what they wanted. The features most preferred were used in new press designs. P. 50

SPACE AGENCY

Approval Assured—Congress is agreed that civilian agency for outer space is needed. It is expected to be a billion-dollar agency before it gets off the ground. P. 63

FEATURE ARTICLES

STAMPING

Tool Up From Die Bank — By taking advantage of existing die components, designers are minimizing tooling costs. They are using the services of a firm that has nearly 50,000 die components carefully catalogued with a card filed for each size and shape of stamping made by the firm. P. 83

THREADED TEST BARS

Lower A-286 Values—Why do threaded test specimens of A-286 fail to meet rigid stress-rupture specifications? It's a problem faced by the aircraft industry. A partial answer lies in the way cross-sectional area is calculated. P. 87

DINKING DIES

Cut Blanking Costs — Because they are easy and inexpensive to make, dinking dies are often preferred over conventional press tools for blanking or piercing thin sheets of soft metals. For many short run jobs, tools may be built as steel-rule dies. P. 90

CHECK SCRATCH DEPTH

Without Guesswork—A new instrument measures scratch depths ranging from 0.030 to 0.0005 in. The unit determines depth by measuring the length of a shadow cast by a beam of light at a set angle across a scratch. P. 92

HIGH-SPEED DIECASTING

Features Automatic Pouring—A transmission plant features automatic pouring of molten aluminum in measured quantities from a holding furnace at each diecasting machine. It results in better castings, fewer rejects. P. 96

MARKETS & PRICES

INVENTORY MILLSTONE

Management Dilemma — Top management is paying more attention to the control of inventories. Finding the answer can pay big dividends. But it's not as easy as it sounds. P. 46

▼

UNION PROBLEM: Automation is keeping union membership at a constant level, while the number of unorganized workers is growing. The increase is in the toughest segment of the labor force to organize—white collar workers. Photo: Cadillac Div., General Motors Corp. P. 41

WILLYS' COMEBACK

Trucks Pay Off—Willys Motors Co. has been making money since quitting the passenger car field in 1955. With the Jeep as its big seller, the firm is finding the truck business profitable. P. 58

ELECTRONICS MAKERS

Ready for Record Year — Far-west electronics manufacturers, who account for almost 25 pct of U. S. sales, are expansion-minded. A widening market is keeping them busy. P. 65

JUNE STEEL BOOM

Rush to Beat Price Rise—The rush is on to beat the expected July steel price boost. Mill schedules are crowded. Some users will be disappointed. P. 125

PURCHASING POLICY

How Ford Plans It—In first of new series of IRON AGE interviews with leading buyers, Harold H. Compson tells how Ford schedules steel orders. Keep buying policy consistent, he cautions, and aim for regularity. P. 126

NEXT WEEK

MACHINING RESEARCH

To Aid Operators—A 17-firm cooperative group is attacking machining problems common to multiple-spindle bar automatics. Next week's technical feature will cover the first stages of the well-conceived project.

WAREHOUSE BOOM

More Expansion Ahead—While most industries are pulling up the reins on capital spending, steel warehouses are expanding at a healthy clip. They've got their sights set on the general business boom that has been predicted for the mid-1960's.

B&W distributors offer you local delivery when you need tubing fast

Wherever your plant is located, there's a handy, nearby source of high-quality B&W tubing. You'll find a B&W sales office in all major cities—and distributors handling B&W Tubular Products are located from coast to coast. It means fast service and *dependable* delivery of the tubing you need, when you need it.

And B&W offers an unusually large selection to choose from. There is a complete range of tubing sizes, grades, finishes and analyses ready for delivery. In stainless, carbon, and high-alloy steels. In seamless or welded, pressure or mechanical tubing. You will find too a convenient local distributor of B&W welding fittings, flanges and small diameter pipe.

B&W's nation-wide network of district sales offices stands ready to assist your distributor *and you* in finding the right tubular product for your special application. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

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Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges —in carbon, alloy and stainless steels and special metals.

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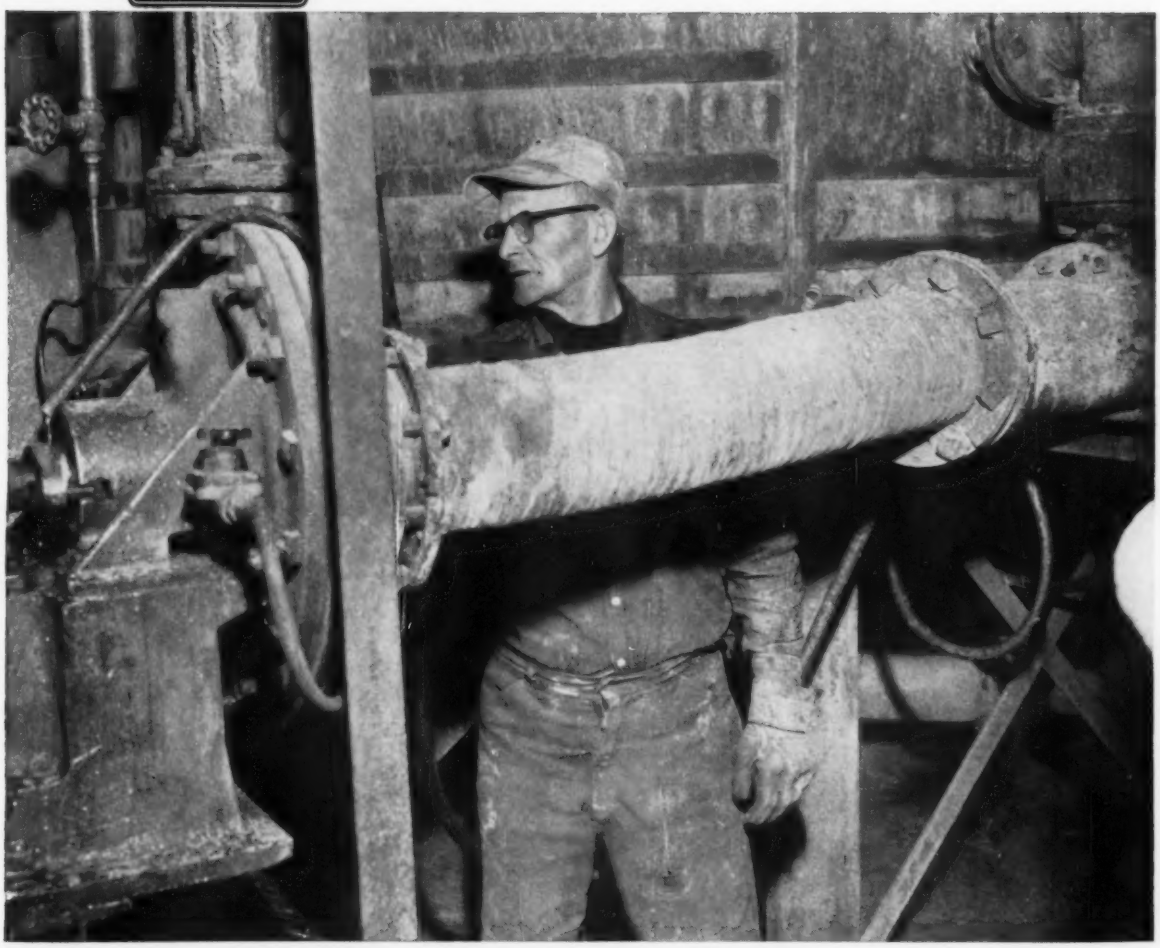


Bang, rattle, shake– pipes were cracking up

B. F. Goodrich improvements in rubber brought extra savings

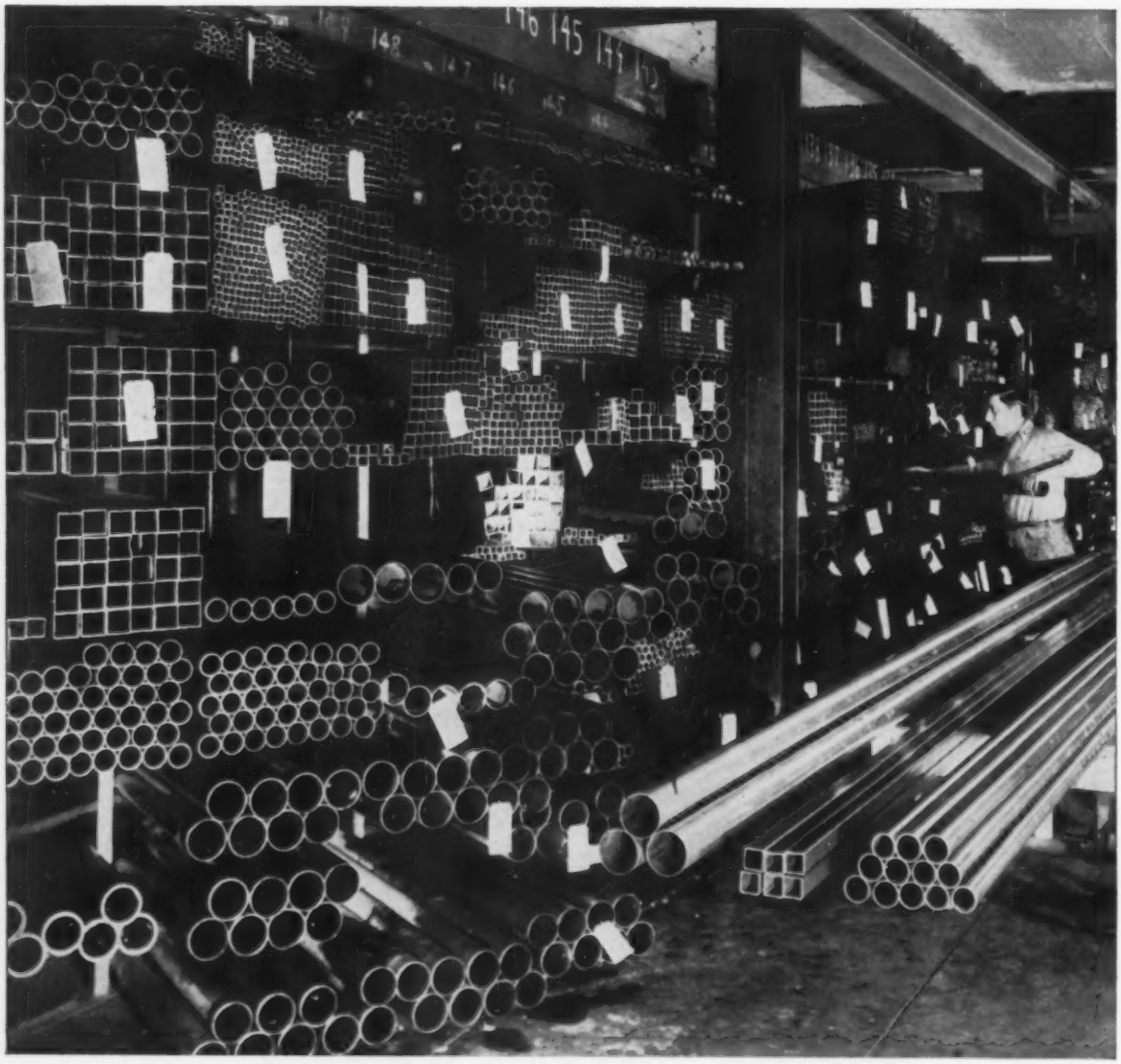
Problem: That powerful pump at left draws hot acid at 400 gallons a minute from tanks, then shoots it through big pipes. The pump vibration shook the pipes until they clanged, rattled and shivered, gradually cracked, leaked, lost corrosive acid that damaged equipment. Pipes had to be replaced two or three times a year.

What was done: The plant superintendent, working with a B.F.Goodrich distributor, decided to replace a short length of lead pipe between the tank and pump with a B.F.Goodrich Flexseal Connector. This is a special kind of hose, made of thick, resilient rubber, which is designed to absorb the pump vibrations traveling along pipelines.

Savings: At a cost of only $105, this B.F.Goodrich hose saved the company $1,000 in the first year by eliminating the harmful shaking that caused broken connections, frequent repairs, costly pipe replacements. Even greater savings will be made because the sturdy, acid-resisting hose is expected to last another two years. A coil of round steel wire, buried in the hose, keeps it from collapsing even under powerful suction.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Dept. M-338, Akron 18, Ohio.*

B.F.Goodrich *industrial products*



The type of tubing you need is here

It pays to analyze your tubing requirements with a Ryerson tubing specialist. He is well qualified to help you select the right tubing for your purpose from Ryerson's diversified stocks.

The Ryerson specialist knows tubing—knows what will work best and why. In many cases, he can recommend a type that will do a better job for you—perhaps a newer type that will save you money, either in first cost or in the cost of using it.

Ryerson carries the nation's largest stocks of steel tubing—all of certified quality—and uses the finest modern equipment to cut to your exact specifications. And Ryerson delivers fast—one tube or a thousand.

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RYERSON STEEL®

Member of the INLAND Steel Family

Tubing in stock: Seamless and welded mechanical tubing; fluid line, pump cylinder and structural tubing; stainless pipe and tubing; PVC pipe and fittings. Also, aluminum tubing in many plants.

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The Business Outlook: The Experts Still Disagree

When you feel better after a particularly rough time, do you tend to believe your recovery is a dream or won't last? Well, that's the way many businessmen feel today, at least those who have noticed a slight business improvement.

The bottom in the metalworking recession has been reached. But it depends on what you call bottom. Some experts say we are not at bottom, that it won't be reached until later this year. Some insist we are in for a relapse next year. To act smiley today or to show optimism is supposed to be plain silly rot.

Most crystal ball gazers believe we are close to bottom if we are not there. Beyond that it is a battle of words and smooth talk. That figures, because most of us don't want to get caught with our batting average down.

The real point is that if we are at bottom and if we are going to see mild improvement this fall and much better business next spring, we ought to act accordingly: We should get out the one-year plan, the two-year plan, and the five-year plan and dust them off.

There will not be a shortage of materials or products when we have our pickup later this year. But a lot of things which can be had with a moment's telephone call today won't come that easily this fall or early next year.

We do not think there will be a long wait before we rise up somewhat from our foggy bottom. We are on our way up now but the figures won't confirm this until they become official 30 to 60 days from now. We won't hit the top levels of 1956 and 1957 any time soon. But we may come closer to them much sooner than expected.

The upsurge in steel production this month is due partly to an attempt by many buyers to beat a $5 to $6 a ton rise in prices July 1. But there is strong buying. A month ago you could have raised an army to say there wouldn't be any kind of a steel pickup, price rise or no.

The machinery industry is in the doldrums, but the trend is slowly upward. Talk about excess capacity overlooks replacement orders, need to offset wage costs, and need for modern equipment to produce quality products. Those factors are as important as mere increased capacity.

Maybe optimists like us may not be exactly on the ball with our forecast of an upturn this fall; but we won't be as far off as the fellows who are calling for a relapse next year.

Tom Campbell

Editor-in-Chief

ROBERT A. NYQUIST, CHIEF CHEMIST
THE ELECTRIC AUTO-LITE COMPANY
BAY MANUFACTURING DIVISION
BAY CITY, MICHIGAN

"In our aluminum anodizing operation, we were encountering excessive gassing from our 15-18% sulphuric acid solutions.* In addition, we were getting a severe sulphate build-up on our lead cathodes and copper bus which was hindering our current carrying capacities. We couldn't control this problem even with our push-pull ventilation, so we began looking about for an effective method of suppression. And we found it!

"With the addition of just *one pound* of Udylite 'Zero-Mist' per 1,000 gallons of anodizing solution, we now control sulphuric mist and hold the spray down to 2-3 inches from top of the solutions. This was checked by saturating filter papers with alkaline phenolpthalein solution and suspending the papers at various levels before and after the addition of 'Zero-Mist' (see inset). The addition of 'Zero-Mist' made necessary by dragout is easily determined by visual and nasal observations. This easily maintained additive is our simple solution to an otherwise difficult processing problem."

Using Udylite 'Zero-Mist' in the anodizing operations such as the Electric Auto-Lite installation, is just one more application for the versatile 'Zero-Mist' family. Let your local Udylite representative demonstrate the many time and money saving advantages of 'Zero-Mist' at your convenience. Call him now, or write direct to:

*Zero-Mist has proven satisfactory in Chromic acid solutions also.

the udylite corporation

detroit 11, michigan • world's largest plating supplier

Chatter-Free Boring Bar

Sir—We noticed with interest an item regarding chatter-free boring bars which appeared in your Feb. 13 issue on p. 75.

We would like to obtain any additional information available regarding these bars and ask that you please let us know the name of the manufacturer so that we may contact him.—C. R. Hibbard, Sales Mgr., Fosdick Machine Tool Co., Cincinnati.

▪ Contact the Fry Tool Manufacturing Co., Eaton, O.—Ed.

Carburizing Help

Sir—I often find your technical articles helpful. One in the May 22 issue (New Cycle Cuts Carburizing Time in Half) was especially useful to me. I would appreciate receiving a reprint of this article, if it is still available.—C. Jones, Foreman, Heat Treat Dept., Cooper-Bessemer Corp., Grove City, Pa.

▪ Copy is on the way.—Ed.

Auto Wheel Bond

Sir—In your issue of Mar. 20 under IRON AGE Newsfront (p. 55), we note an item entitled "New Bond for Auto Wheels." We are interested in this process and would greatly appreciate additional details on its nature and the company involved.—G. T. Piper, Eng. Div., The Hoover Co., Canton, O.

▪ Write the National Lead Co., Public Relations Dept., 111 Broadway, New York 6.—Ed.

Powdered Parts

Sir—On p. 59 of the Mar. 13 issue of IRON AGE there appeared a brief article regarding "King-Size Powdered Parts." This article stated that a six million pound pressure press was in operation turning out parts up to 30" in diameter.

We would be interested in knowing the company operating this press since we have an application above the range of our equipment. J. F. Helsel, Vice Pres. & General Mgr., Ferro Powdered Metals, Salem, Indiana.

Sir—We are much interested in additional information concerning the six million pound pressure powder metal pump press referred to in the Mar. 13 issue of your excellent publication. — H. Frommelt, Dir., Spring Garden Institute, Metal Removal Center, Phila.

▪ Contact Robert Heath, Public Relations Dept., Chrysler Corp., 345 Massachusetts Ave., Highland Park, Mich.

There's a Satisfied Customer back of most orders for

Diamond Perforated Metals

Naturally, we're always glad to make new friends and open up new accounts but, more and more as time goes on, the greater part of our business comes from concerns that have dealt with us before—some of them for nearly half a century.

One Reason is because they have learned that Diamond Perforated Metal Products are always reliable and our charges in line with competition of comparable quality. Another Reason is because our facilities are so complete, and our stock of dies so extensive, that almost any demand for perforated metal sheets, plates or parts can be taken care of promptly, accurately and economically.

ALL inquiries receive prompt attention. Illustrated catalogs give helpful working data—show many modern applications—enable you to select the best pattern for any purpose.

DIAMOND MANUFACTURING CO., WYOMING (Wilkes-Barre Area) **PENNA.**

New Bulletin No. 47, Describes DIAMONTEX Perforated Metal Lay-in Panels for Modern Acoustical Ceilings.

Welsbach High Pressure Service Gas Valve with Revere Arsenical Bronze Stem.

REVERE

Deep-Drilling Brass Rod

Increases Tool Life over 200% for Welsbach Why not try it yourself?

In the manufacture of valves the Kitson Division of The Welsbach Corporation, Philadelphia, Pa., has to deep-drill brass rod. Originally the rod was free-machining brass. However, when Revere discovered the extent of the drilling it was suggested that our Mixture 252, Deep-Drilling Brass, would be preferable. This was tried, and the machine shop foreman reported that tool life was increased over 200%. In one item it is possible to bore with a single operation, against the former practice of withdrawing the drill three times in order to clear the chips. Revere's Deep-Drilling brass produces very small, easily cleared chips.

Another item is a high pressure gas valve, with a cast body and brass rod stem. The rod was changed to arsenical bronze, which costs a bit more, but it ended flaking and galling between stem and seat, and materially reduced rejects. Still another instance of Revere service concerns a hot water heater relief valve. The original model was cut out of bar stock. We suggested a high leaded brass tube, hexagon outside, round inside. This greatly reduces machining, has a better surface, and a better seat. Costs more by the pound, but saves more by the piece.

Revere salesmen and Technical Advisors are always glad to collaborate in seeking ways to save money and improve products. Perhaps we can help you!

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Newport, Ark.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere

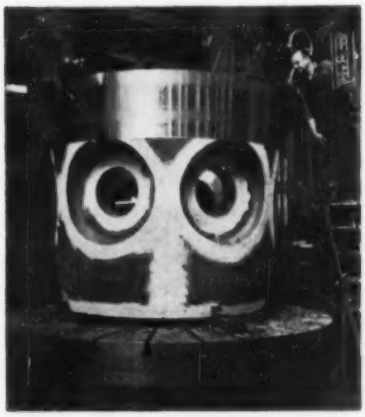
Welsbach Temperature-Pressure Relief Valve.

Welsbach Emergency Gas Shut-Off Valve, automatic.

Pressure Relief Valve for water heaters.

Metals Witchcraft?

Witchcraft and witchdoctors are much in vogue in present day popular music. But the trend hasn't spread to metalworking despite the photograph below.



It's not the ritual mask of a giant economy-size practitioner of magic. It's a hydraulic turbine runner hub built by Allis-Chalmers Manufacturing Co. and destined for duty on the St. Lawrence Power Dam. And the markings that make up the eyes and nose are actually to show machinists where metal has to be cut away.

Electronics Daffynitions

Recently this column has been discussing words and what they do or don't mean. Well here come some "daffynitions" of electronics terms from Harold S. Sharp, Chief Librarian, Farnsworth Electronics Co., Fort Wayne, Ind.

Prism—Alcatraz, for example.
Hum—Something there's no place like.
Nuclear—Scotch expression for change of weather after a storm.
Faraday—As in television program, "King Faraday."
Feed—Where shoes are worn.
Impedance—What a fresh kid talks to people with.
Kopp Law—The kind that's in a night stick.
Shunt—Opposite of should.
Choke—German humor, equivlent to Swedish "yoke."
Watt—How's that again?
Ion—Something to press pants with.
Make a Bid—Rearrange sheets, blanket, and pillows.
Amplifier—Hot enough.
Atom—Other half of uppan.
Magnet—Successful tycoon.

Puzzler Answer

How does this look as the answer to the May 29th puzzler about the four sevens that must equal 56 by using all four signs—multiplication, minus, divide, and add:

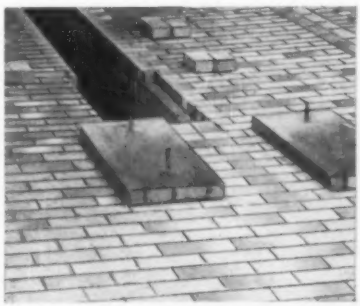
$$-(7 \div 7 + 7) \times (-7) = 56$$

If that's right then W. W. Bell, The Lummus Company had the only correct answer. There were reams of other answers but they were all trapped by leaving out the minus sign. Oh, well.

"What he meant was, 'We haven't had a contract like that for two weeks.'"

Atlas

INDUSTRIAL FLOORS STOP CORROSION



. . . in pickling and plating rooms!

Atlas Industrial Floors in your pickling and plating rooms will permanently stop corrosive attack . . . not merely retard or control it. They are resistant to the widest range and concentrations of acids, alkalies, salts and solvents.

These floors are constructed of acid brick laid on an impervious membrane and joined with Atlas corrosion-proof cement. There is a wide choice of cements available . . . each to solve a specific problem.

Atlas floors are engineered to withstand all types of physical abuse from heavy static loads to constant truck traffic.

Make an Atlas Floor your permanent corrosion-proof base for operations.

Write for Bulletin 3-3 giving complete details.

ATLAS MINERAL
MERTZTOWN, PENNSYLVANIA

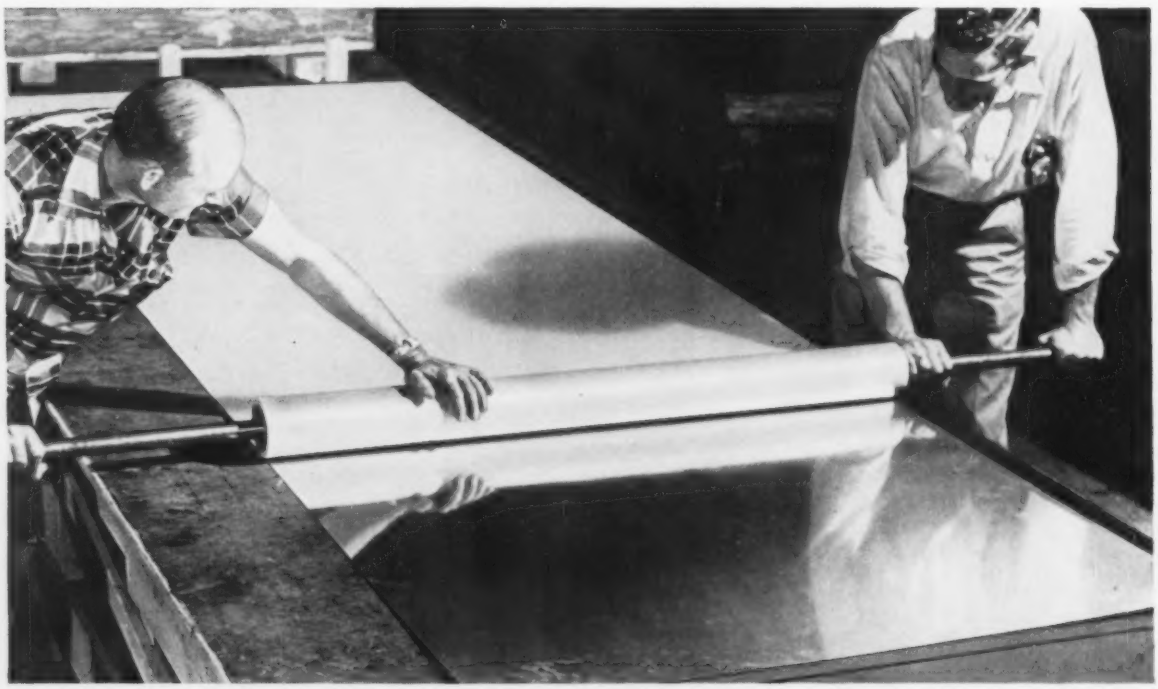
Another industrial need filled by 3M laboratories . . .

This "SCOTCH" Brand Tape shrugs off scratches!

Here's positive protection for polished and finished sheet material such as stainless steel, aluminum, and other fine-finished surfaces. You know how such surfaces seem to *attract* scratches and marring! "SCOTCH" Brand Protective Tape No. 343 is now providing "pennies a day" protection for producers and fabricators using these materials.

A thin, tough, pliable paper backing, combined with an elastic, high film-strength adhesive, "SCOTCH" Brand Protective Tape resists abrasion and pressure—can actually be used to protect materials during die stamping and forming operations. The backing is smooth . . . pattern layouts can be marked on tape to aid cutting and fabricating. It is easy to apply; easy to remove. "SCOTCH" Brand Protective Tape No. 343 is one example of the many specialized pressure-sensitive tapes in the world's most complete line. Ask your local "SCOTCH" Brand Tape distributor for further information, or write us direct. Address: Minnesota Mining and Manufacturing Company, St. Paul 6, Minn., Dept. DE-68.

"SCOTCH" is a registered trademark of 3M Co., St. Paul 6, Minn.



When tape costs so little, why take less than . . .

REG. U. S. PAT. OFF.
SCOTCH BRAND **Protective Tapes**

MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

COMING EXHIBITS

Western Packaging & Materials Handling Show — Aug. 11-13, Civic Auditorium, San Francisco. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Chemical Show—Sept. 9-12, International Amphitheater. Chicago. (National Chemical Exposition, 86 E. Randolph St., Chicago 1.)

Packaging & Materials Handling Show—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 S. LaSalle St., Chicago 4.)

Plastic Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

MEETINGS

JUNE

The American Society of Mechanical Engineers—Semi-annual meeting June 15-19, The Statler Hilton Hotel, Detroit. Society headquarters, 29 W. 39th St., New York.

American Foundrymen's Society—Annual foundry instructors seminar, June 19-21, Case Institute of Technology, Cleveland. Society headquarters, Golf & Wolf Rds., Des Plaines, Ill.

Alloy Casting Institute — Annual meeting, June 21-24, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

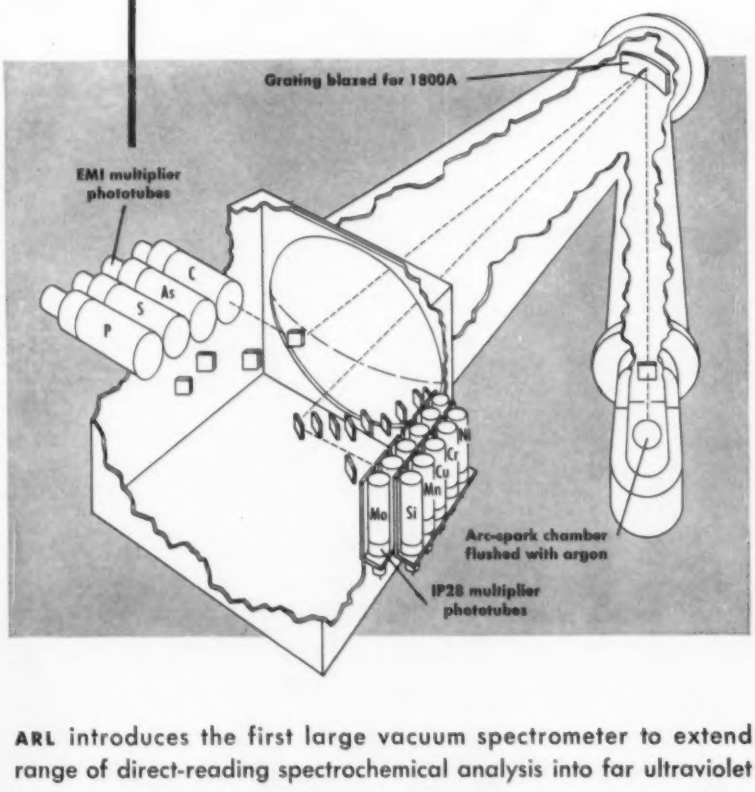
American Society for Testing Materials—Annual meeting and exhibit of scientific apparatus and laboratory supplies, June 22-27, Hotel Statler, Boston. Society headquarters, 1916 Race St., Philadelphia.

American Institute of Electrical Engineers—Summer general meeting, June 23-27, Hotel Statler-Hilton, Buffalo. Society headquarters, 33 W. 39th St., New York 18.

Investment Casting Institute — Spring meeting, June 23-25, Occidental Hotel, Muskegon, Mich. Society headquarters, 27 E. Monroe St., Chicago 3.

(Continued on P. 16)

New Quantovac adds C, S, & P to metallic elements for complete high-speed analysis of steel & cast irons



ARL introduces the first large vacuum spectrometer to extend range of direct-reading spectrochemical analysis into far ultraviolet

The iron and steel industry has an important new high-speed analytical tool. For the first time, carbon, sulfur and phosphorus can be analyzed simultaneously with all the metallic elements in a few minutes. These nonmetallic elements no longer require expensive, separate analysis. Now, this one high-speed, direct-reading instrument will do the complete job.

By means of an evacuated spectrometer and argon-flushed arc-spark chamber, the Quantovac extends the spectrum range into the far ultraviolet. It thus provides the most sensitive arc lines of C, S, P, As, and Se for spectrochemical analyses, besides the usual lines of the metallic elements. In fact, as many as 24 elements may be analyzed simultaneously in the 1600-3300A range with the Quantovac.

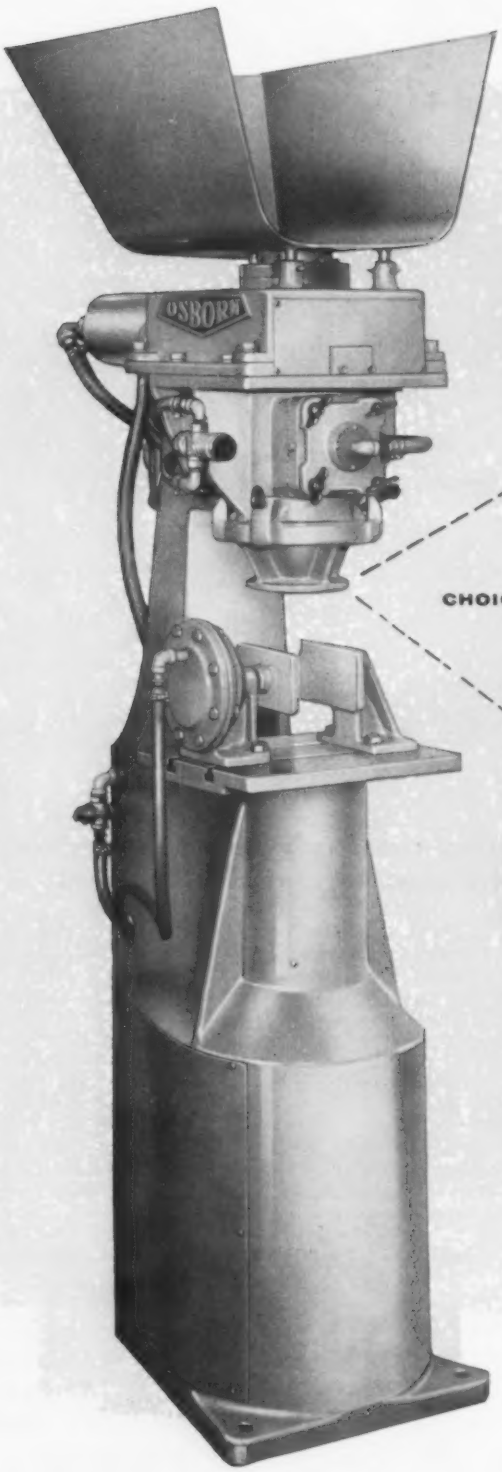
The Quantovac will provide high-speed furnace control. It will save time and labor. Please write for full information. Your inquiry will be answered fully and promptly.

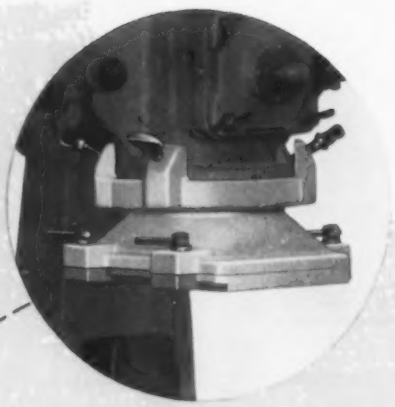
*TRADE MARK

APPLIED RESEARCH LABORATORIES, INC.
subsidiary of BAUSCH & LOMB OPTICAL CO.
P. O. BOX 1710, GLENDALE 5, CALIFORNIA

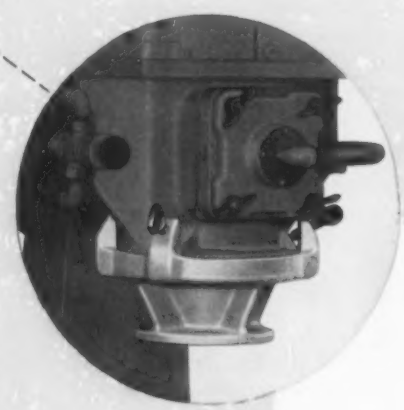
BRANCH OFFICES : NEW YORK • PITTSBURGH • DETROIT • CHICAGO • HOUSTON • LOS ANGELES
LAUSANNE, Switzerland • LONDON, England

NEW from OSBORN....





CHOICE OF TWO QUICK-CHANGE BLOW HEADS



MOLDING MACHINES • CORE BLOWERS • SHELL MOLDING MACHINES • BRUSHING MACHINES • INDUSTRIAL BRUSHES

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION MEMBER FEMA

JET-CORE

SAND TO FINISHED CORE AUTOMATICALLY

AUTOMATIC CORE BLOWER

for low-cost, high production of quality small cores

Newest equipment development in Osborn's famous line of foundry production machinery is the No. 906 JET-CORE Automatic Core Blower.

Designed for use in production, semi-production or jobbing foundries, the JET-CORE produces quality cores at extremely low cost . . . automatically . . . at high production rates.

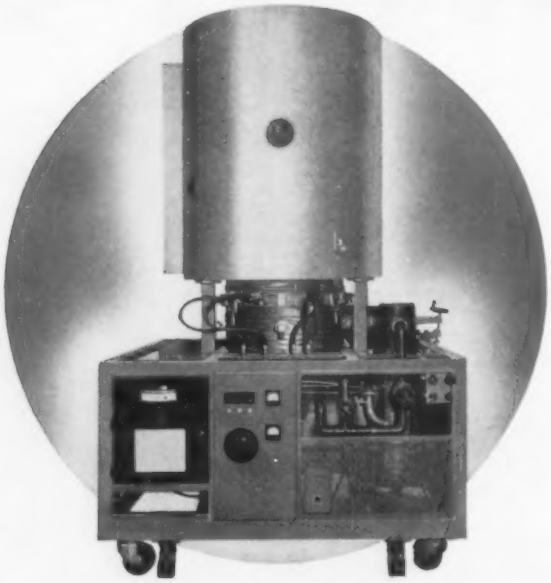
Write us for full details on the new JET-CORE and how it can help you trim costs and boost foundry profits. *The Osborn Manufacturing Company, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN JET-CORE FEATURES

- Automatic, single push-button operation.
- High-speed machine cycle time — 2 seconds.
- Improved jet action blow.
- Choice of quick-change blow heads speeds setup time — standard head with readily changed blow plate . . . funnel head for jet blow.
- Stationary head . . . no reservoir movement for filling.
- Core-Blower table adjusts and locks hydraulically.
- Unit is exceptionally compact.
- Designed to deliver highest quality cores faster . . . at low cost.

leader in mechanization for the foundry OSBORN

HIGH VACUUM
ANNEALING • SINTERING • WELDING • BRAZING &
HEAT TREATING



Kinney®

HIGH VACUUM FURNACES

The Bell-type Annealing Furnace shown above is but one of many KINNEY High Vacuum Furnaces developed for improved metal treating. From melting, alloying and casting to degassing, sintering, annealing, brazing and welding, KINNEY provides the High Vacuum equipment to meet your special needs for product improvement.

The approach of KINNEY engineers to modern High Vacuum techniques is based upon many more years of Vacuum "know-how." This is reflected not only in the practicality of the equipment but in the economic advantages in design, operation and maintenance, as well. Write for outline of advanced techniques in vacuum heat treating, or better still, make a date to discuss your Vacuum Furnace problems today!

WRITE FOR LITERATURE DESCRIBING NEW DEVELOPMENTS IN HIGH VACUUM EQUIPMENT

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3634 P WASHINGTON STREET • BOSTON 30 • MASS.

Please send me your latest literature on KINNEY Heat Treating Equipment ☐ Please have an engineer call me ☐

Name_____

Company_____

Address_____

City_____ Zone____ State_____

EXHIBITS, MEETINGS

(Continued from P. 13)

American Marketing Assn. — National conference, June 24-26, Harvard Graduate School of Business, Boston. Society headquarters, 27 E. Monroe St., Chicago 3.

Industrial Safety Equipment Assn., Inc.—Annual meeting, June 24-27, Oyster Harbors, Osterville, Mass. Society headquarters, 420 Lexington Ave., New York.

Drop Forging Assn.—Annual meeting, June 25-28, The Homestead, Hot Springs, Va. Information: D. M. Allgood, exec. vice president, Drop Forging Assn., Cleveland 13.

JULY

Truck-Trailer Manufacturers Assn. —Summer meeting, July 14-16, Homestead, Hot Springs, Va. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

SEPTEMBER

National Petroleum Assn.—Annual meeting, Sept. 10-12, Hotel Traymore, Atlantic City, N. J. Society headquarters, Munsey Bldg., Rm. 958, Washington, D. C.

Steel Founders' Society of America —Fall meeting, Sept. 22-23, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland 13.

Air Moving & Conditioning Assn., Inc.—Annual meeting, Sept. 22-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 2159 Guardian Bldg., Detroit 26.

Porcelain Enamel Institute — Annual meeting, Sept. 25-27, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

The Electrochemical Society, Inc.— Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, New York.

Pressed Metal Institute — Annual meeting, Sept. 28-Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

There is no substitute for stainless steel in automobiles

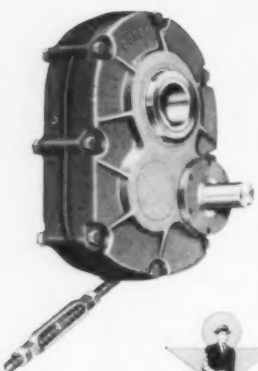
No other material is as bright, strong and resistant to rust and wear as Stainless Steel. It gives every car the clean, exciting beauty that sells in the showroom and re-sells on the used car lot. Look for *Stainless Steel* on your new automobile.

Specify McLouth high quality sheet and strip Stainless Steel. McLouth Steel Corporation, Detroit 17, Michigan.

McLOUTH STAINLESS STEEL

THERE'S QUALITY IN TORQUE-ARM

...AMERICA'S MOST WIDELY USED SHAFT-MOUNTED SPEED REDUCER



Extreme ruggedness and top quality are built into every detail of the Dodge Torque-Arm Speed Reducer—from the specially heat treated helical steel gears to the corrosion resistant semisteel housing. Broad demand has made it necessary to add sizes until today Torque-Arm is America's most complete (and most widely used) line of shaft-mounted speed reducers. Capacities range from 1 to 100 hp; output speeds from 12 to 378 rpm.

Torque-Arm is mounted on the driven shaft, in any vertical or horizontal position. It is anchored by the torque-arm fastened to any fixed object. No need for foundation, flexible coupling, sliding base. No lining up difficulties. The unit is driven through any V-belt drive. Savings up to 1/3 are possible and Torque-Arm's efficiency is high. It delivers 97% efficiency in double reduction models; and almost 99% in single!

Ask you local Dodge Distributor—or write us for bulletin.

DODGE MANUFACTURING CORPORATION
800 Union Street, Mishawaka, Indiana

CALL THE TRANSMISSIONEER
—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the white pages of your telephone directory for "Dodge Transmissioneer."

DODGE
of Mishawaka, Ind.

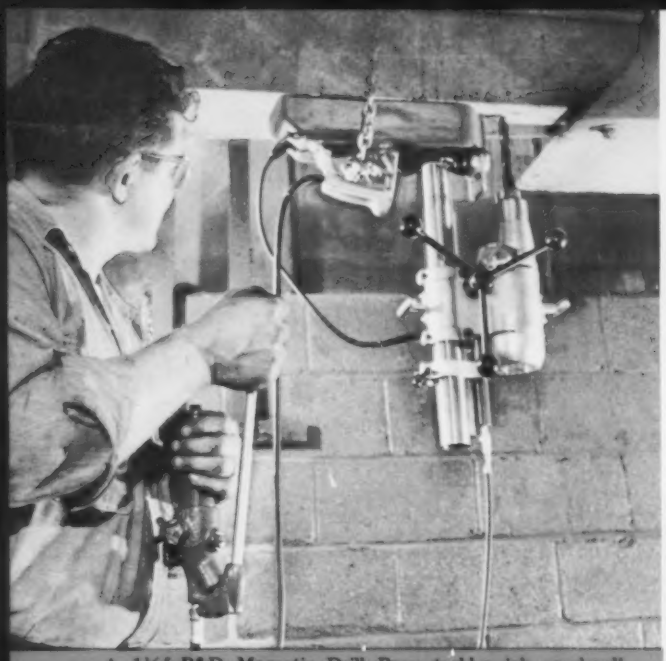
Sticks like glue . . . works in any position

You are looking at a Black & Decker Magnetic Drill Press at work 15 feet above the ground! No operator holds it—it *holds itself* to the work with over a thousand pounds of magnetic power. No operator touches it—he feeds it precisely into the work with fingertip pressure on the exclusive B&D Hydra-Power Feed. It may be used in any position—upside down, on its side or upright.

The new B&D Magnetic Drill Presses are truly so unusual they must be seen to be appreciated. They come in two capacities—¾" and 1¼". They are complete precision units—not attachments. They drill, ream and tap in any position. They are ideal for tool shops, steel fabricators, heavy machinery, maintenance . . . anywhere you have to take a drill press to the work.

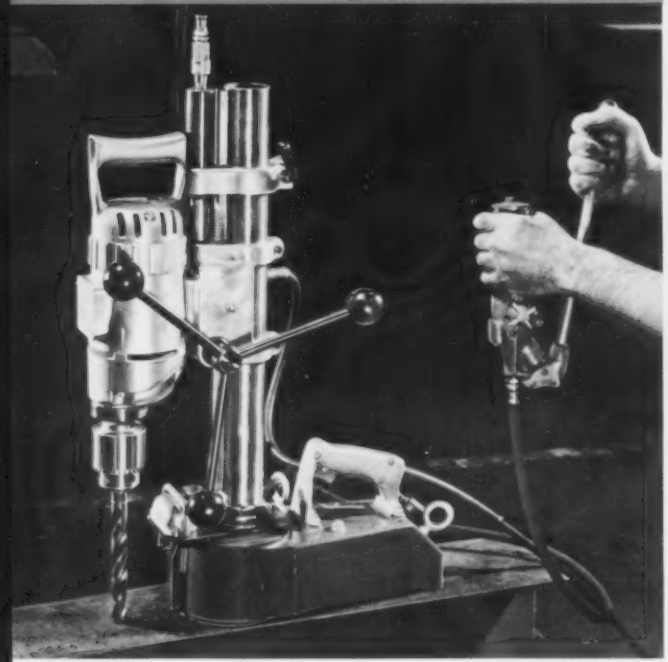
See the feature story on the

New Black & Decker Magnetic Drill Presses

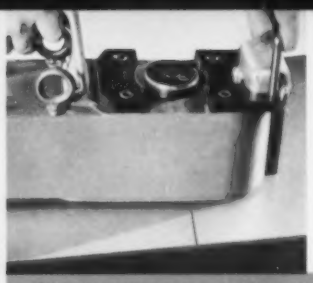


▲ 1¼" B&D Magnetic Drill Press tackles job overhead! (Up to 1¼" capacity.)

▼ ¾" Black & Decker Magnetic Drill Press working in upright position. (Up to 1⅛" capacity.)



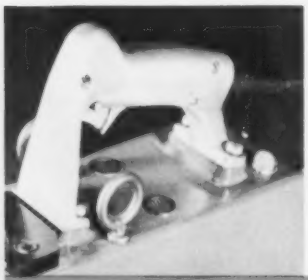
Drilling . . . Reaming . . . Tapping. Upside down . . . right side up . . . sideways . . . there's nothing like a Black & Decker Magnetic Drill Press. See it soon in your shop!

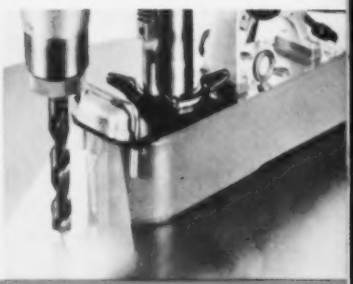


▲ **Multiple Use!** Magnetic Unit of 1¼" press may be used to hold pieces for butt welding, aligning, etc!

▲ **Closest Tolerances!** Drill Point Locator provides accuracy never before possible! Built into magnet.

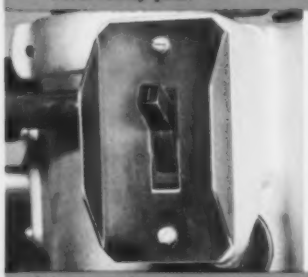
Check these exclusive Black & Decker features!

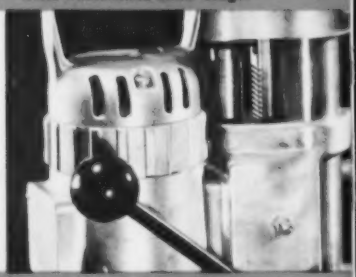




▲ **Safety-Grip Switch** keeps magnet always "on" after operator releases switch trigger—another safety plus.

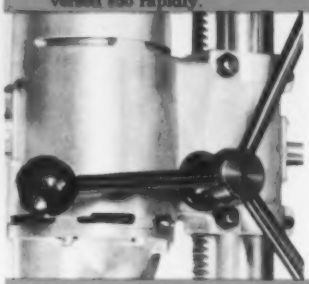
▲ **Work Area Brightly Lit** by exclusive headlight. Simplifies positioning. Special ruggedized bulb withstands hard usage.





▲ **Longer Life—Increased Safety** results from built-in time delay in 1¼" Reversing Switch. Prevents motor being reversed too rapidly.

▲ **Longer Life—Increased Safety** as ring type Reversing Switch of ¾" Press is turned. Switch goes to "neutral" then "on" again in other direction.



▲ **Highest Accuracy** results from unitized construction of drill press—cannot work loose, no side play.

▲ **Increased Safety** due to location of magnet near drill point. Maximum magnetic power at drill pressure point.

MAIL COUPON TODAY FOR A FREE DEMONSTRATION!

THE BLACK & DECKER MFG. CO., Dept. 0905, Towson 4, Md.

Gentlemen:

☐ Please arrange a demonstration of your .....1¼"; .....¾" Magnetic Drill Press

☐ Please send me additional information

Name..... Title.....

Company.....

Address.....

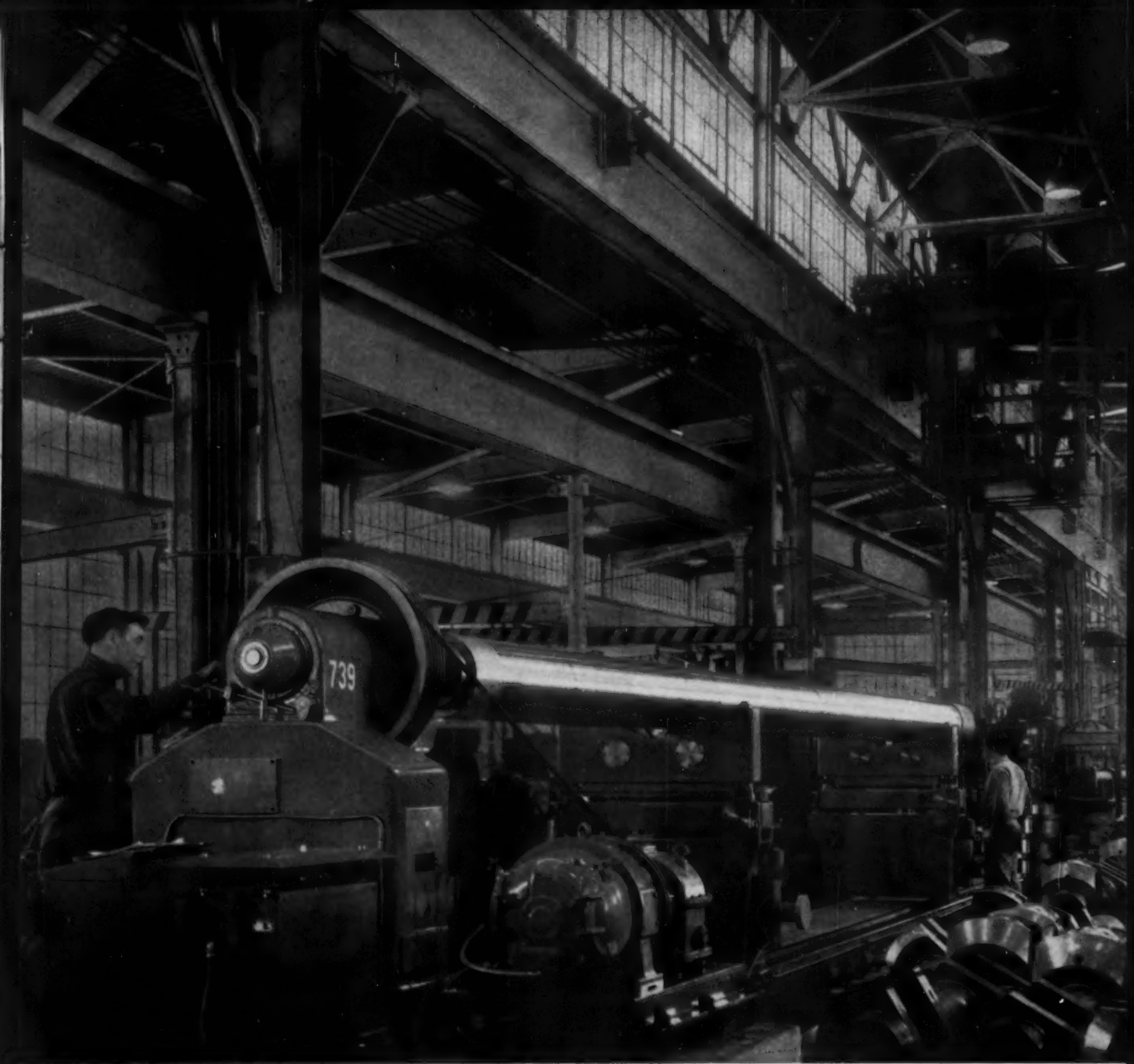
City..... Zone..... State.....

Look Under "TOOLS-ELECTRIC" in Yellow Pages

Leading Distributors Everywhere Sell

Black & Decker®

Quality Electric Tools — Power-built for top performance



WHO FORGES THE TOUGH ONES?
and dynamic balances them, too?

To further National Forge's reputation for producing precise forgings, we've installed one of the largest, most accurate dynamic balancing machines in use. Our American-Trebel has a 33,000-pound, 60-foot capacity.

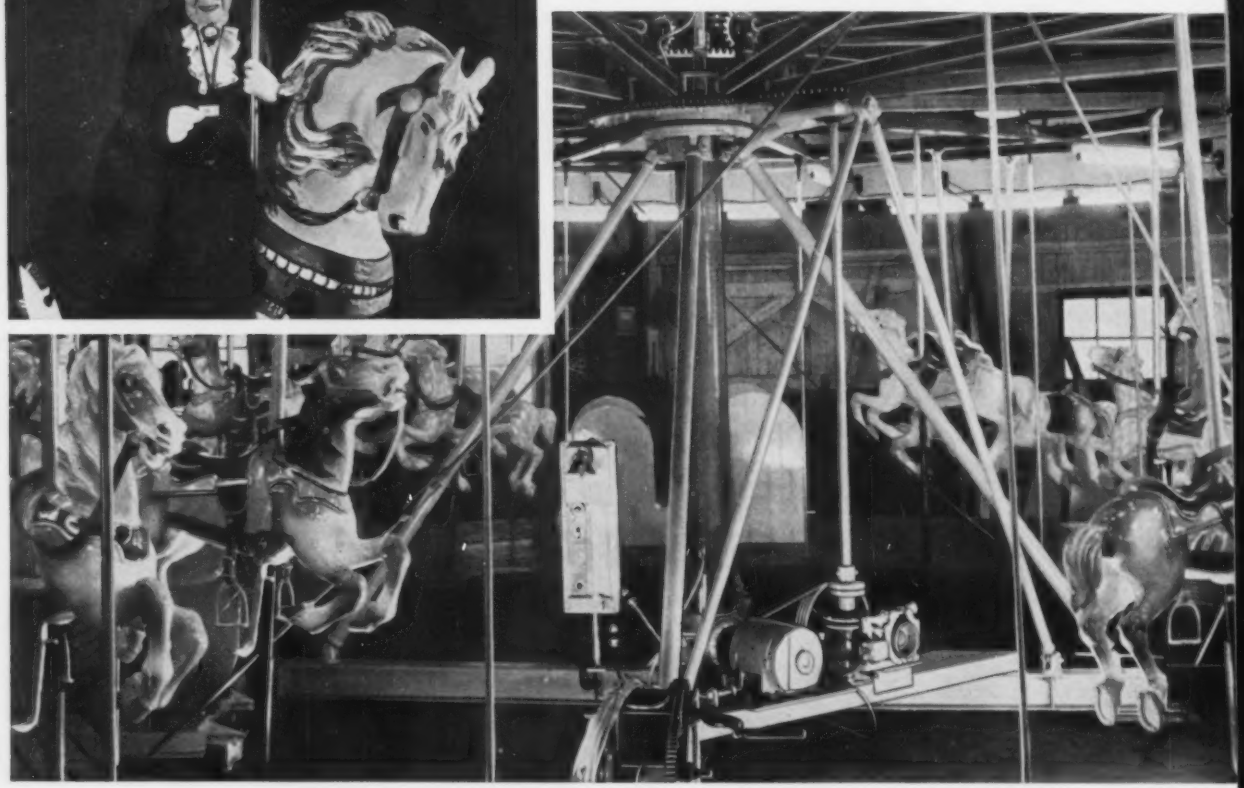
Pictured on the machine is a 42 ft. propeller shaft that has been forged, machined, and hollow bored—all operations done in our National Forge plant. NFO specialists are shown balancing this 15,500 lb. shaft to within 730 ounce-inches in two planes.

If you want one responsible source to produce and control the quality of your forgings . . . from melting and forging the steel through machining and dynamic balancing . . . call National Forge. Let us quote on your next job—and *prove* "who forges and dynamic balances the tough ones . . . best!"

NATIONAL FORGE & ORDNANCE COMPANY
IRVINE, WARREN COUNTY, PA.

For information on the "tough" ones and the machinery that makes them best, write for Bulletin NFO 1.

Since 1880, Allan Herschell Company, Inc., North Tonawanda, New York, have created safe, appealing rides in the highly specialized field of engineering and constructing carnival and park amusements. Republic ELECTRUNITE is used extensively.



Meet severe design, engineering, service requirements with

Republic ELECTRUNITE Mechanical Tubing

ROUNDS... SQUARES... RECTANGLES

Republic ELECTRUNITE® Mechanical Tubing offers many outstanding fabricating advantages in the highly specialized field of creating, engineering, and constructing carnival and park amusements. That is why the Allan Herschell Company, Inc., world's largest manufacturer of merry-go-rounds and amusement rides, specify ELECTRUNITE.

For example, Republic ELECTRUNITE 3" Square Tubing is used for the sweeps which radiate from the top of the merry-go-round. Horses and other equipment are suspended from these sweeps, as well as passenger loads.

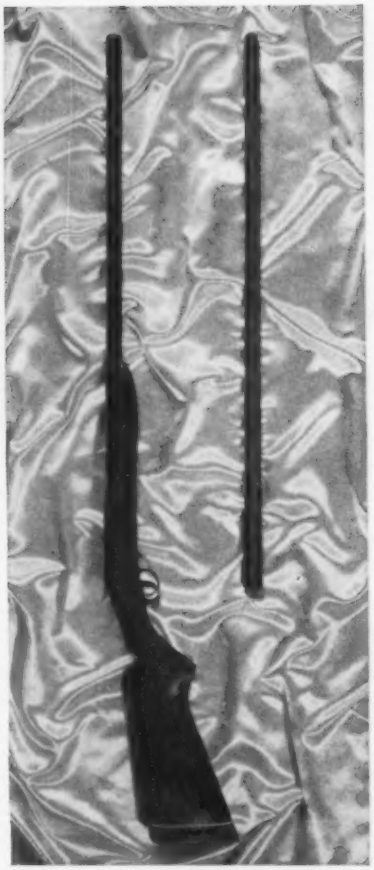
ELECTRUNITE is strong, rugged, lightweight with high strength-to-weight ratios that assure safe, dependable day-in, day-out operation. Because of this lightness and strength, portable amusement equipment built with Republic ELECTRUNITE is easy and economical to set up, take down, and transport.

With Republic ELECTRUNITE, strength, weight, and safety are built-in because ELECTRUNITE is quality controlled from Republic mines, through Republic mills, to manufacturing. ELECTRUNITE is produced from highest quality flat-rolled open-hearth steel, welded by the exclusive ELECTRUNITE process – a continuous electric weld method that unites the wall under pressure without the addition of foreign or extra metal. Tests prove the ELECTRUNITE weld is as strong or stronger than the original base metal.

Republic ELECTRUNITE Tubing fabricates easily, economically, with uniformity. It is available in a wide range of sizes and provides uniform wall thickness, ductility, concentricity, diameter, and other physical and mechanical properties in flanging, flaring, bending, expanding operations.

Let Republic engineers help you select ELECTRUNITE Tubing to meet your many and varied needs. Call your Republic representative or write today.

SOLVE DIFFICULT ASSEMBLY PROBLEMS WITH REPUBLIC HEX HEAD CAP SCREWS, available in a wide variety of steel analyses including ENDURO® stainless, alloy, high carbon (heat treated) and low carbon in sizes suited to all types of precision assemblies. Diameters range from ¼ inch to 2 inches inclusive, with lengths to 12 inches. Fine or coarse threads are provided in each size and material—and other head styles can be furnished on request or order. Write today.



REPUBLIC COLD FINISHED BARS answer the problems of deep-hole drilling, reaming, bore-burnishing, and long-length turning operations for Harrington & Richardson, Inc., leading manufacturers of all types of small arms. Investigate the many Republic Cold Drawn Bar advantages for your operations. Send for data.

REPUBLIC ALLOY STEEL shrugs off fatigue, terrific torque, high impact load, in motor graders built by Adams Division of LeTourneau-Westinghouse Company. The grader's full-floating, two-section drive axle is made of Republic Hot Rolled 4340 Alloy Steel, resists fatigue, is able to take high torque without permanent set. Write today.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
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1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

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☐ Republic ELECTRUNITE Mechanical Tubing
☐ Round ☐ Rectangle ☐ Republic Cap Screws
☐ Square ☐ Alloy Steel ☐ Cold Finished Bars

Name_____ Title_____

Firm_____

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BREAKFAST CEREAL

bulk-transported by

AMERICAN MONORAIL

Electric power unit drives 4 hopper cars, each with 350 lbs. capacity. Product travels from 2 load-weigh stations to 2 packaging lines.

How costs were cut . . .

A leading manufacturer of food products has cut costs by transporting unit loads of bulk breakfast cereal with American Monorail. Ten Monorail trains with 4 hopper cars per train operate near the ceiling. This reduces floor traffic, increases plant safety, and the product is kept clean and free from contamination.

A Monorail system can be installed at your plant that will improve your work flow, increase usable floor space, and reduce your handling costs.

Send NOW for free literature.

AMERICAN MONORAIL

ENGINEERED MATERIALS HANDLING

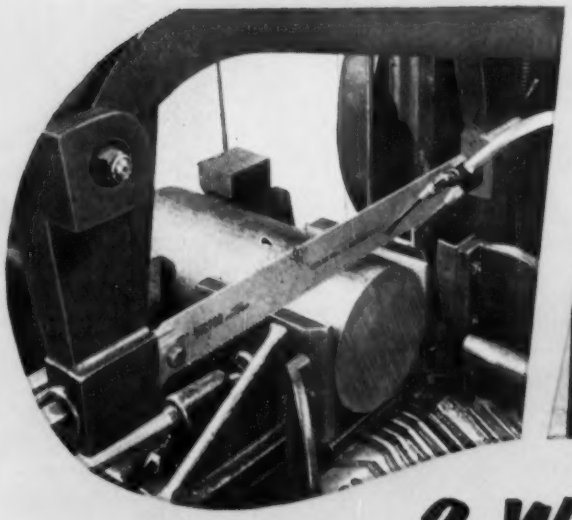
13103 ATHENS AVENUE
CLEVELAND 7, OHIO

OVERHEAD HANDLING EQUIPMENT

MEMBER OF MATERIAL HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION

CUT

Metal Cutting Costs



2 Ways

with VICTOR HIGH SPEED STEEL POWER HACK SAW BLADES

Victor Power Hack Saw Blades guarantee lowest cutting costs. Reason? Only the finest alloyed high speed steel sheets, blanked, toothed, set, hardened and tempered under precision methods, with automatic controls, are used in Victor blades. Production equipment individual to Victor produces blades of unequalled uniformity and performance.

with VICTOR FLEX METAL BAND SAWS

Victor offers a new, improved Flex Metal Cutting Band in every type—standard, Skip Tooth, Profile and Gored Tooth. Here, too, the finest steels and special equipment, produce fast cutting, long wearing qualities, and exceptional uniformity. Available in cut to length welded saws, as well as 100 foot coils, conveniently packaged, there is a Victor Band Saw to meet every need.

The production team behind Victor Metal Cutting Saws represents the combined knowledge, experience and craftsmanship developed over almost three quarters of a century.

FREE

—for your shop, an illustrated, informative VICTOR Metal Cutting Wall Chart. In addition, VICTOR would like to send you a handy METAL CUTTING GUIDE-BOOK. It's packed with valuable information on blade types, cutting techniques, feeds and speeds . . . plus important general information on metal cutting.

INDUSTRIAL DISTRIBUTORS THE RIGHT HAND OF PRODUCTION

VICTOR 1225

SAW WORKS, INC. • MIDDLETOWN, N. Y., U.S.A.
Makers of Hand and Power Hack Saw Blades, Frames and Metal and Wood Cutting Band Saw Blades

VICTOR SAW WORKS, INC.
Middletown, N. Y., U.S.A.

☐ Please send me the Victor Metal Cutting Chart
☐ Please send me the Victor Metal Cutting Guide

Name_____

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Weldynamics

ARC WELDING AT WORK CUTTING COSTS

Completely automatic welding...guided by hand with the "Mechanized Squirt Welder"

Here's how you can get the speed and sureness of automatic welding . . . plus portability and versatility never before heard of in submerged arc welding.

Mechanized gun is propelled at any preset speed while electrode and flux are fed from an all day supply on the compact, portable control unit.

- **Accurately controlled speeds from 1 to 70 inches per minute.**
- **Flux and wire supplies allow many hours of continuous welding.**
- **Guides in any direction without fixtures.**
- **Deep penetration of submerged arc welding.**
- **Easy to make beautiful welds.**
- **High operator appeal—light gun, no helmet.**

TRIGGER—*Single trigger starts and stops flux flow, wire feed, and welding current.*

SPEED CONTROL AND REVERSING SWITCH—*Speed control dial calibrated in inches per minute. Can be changed while welding. Reversing switch determines direction of travel.*

TRAVEL MOTOR AND DRIVE WHEEL—*Propels gun in any direction at desired speed.*

ELECTRODE—(5/32" or 1/4")—*Feeds continuously from 60 lb. coil in control unit through extra flexible cable.*

MOTOR MOUNT—*Travel motor easily adjusted up or down to control flux coverage and rotated around the gun to change travel direction. Control wire coupling disconnects for quick removal of entire travel mechanism for manual operation.*

FLUX—*Granular flux feeds through tube from tank on control unit to small reservoir on gun. Flows from gun by gravity as needed.*

PORTABLE CONTROL UNIT (*not shown*)—*Contains arc voltage and inching speed controls as well as meters for welding current and voltage. Unit also mounts 60 lb. coil of electrode and tank for over 100 lbs. of flux. Entire control system operates on 115 volt AC power.*

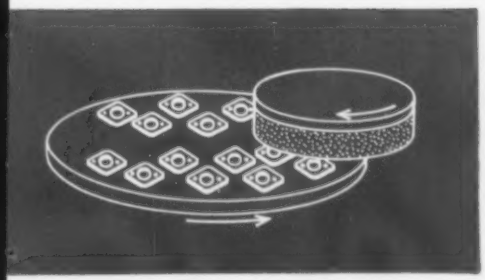
The World's Largest Manufacturer of Arc Welding Equipment

LINCOLN

© 1958 The Lincoln Electric Company

THE LINCOLN ELECTRIC COMPANY, Dept. 1543, CLEVELAND 17, OHIO

7500 more parts per disc after changing to Gardner



Workpiece .....Steel exhaust flange
Production .....47,500 parts per disc
Former Disc .....40,000 parts per disc

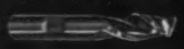
Call the Gardner Abrasives Man to demonstrate disc grinding efficiency the Gardner way.

GARDNER
abrasive discs
BELOIT, WISCONSIN

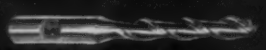
COMPARE this DoALL 3-flute end mill...

A few of the types available

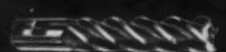
D-645—3 Flute Ball End



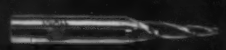
D-680—2 Flute for Aluminum



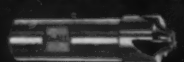
D-618—2 Flute Long Flute



D-675—Controlled Penetration

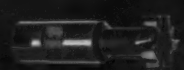


D-690—Tapered 3 Flute

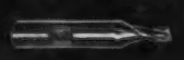


D-638—Corner Rounding

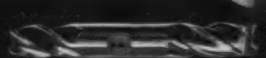
D-751—Dovetail



D-571—T-Slot



D-636—2 Flute Stub Flute



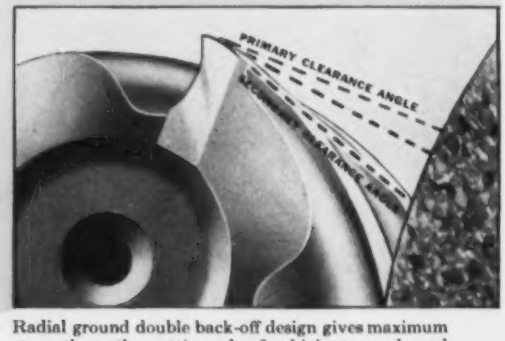
D-606—4 Flute

Three flute end mills with 2" diameter and 2" shank in 4", 6", 8", and 10" flute lengths—another case of how specials are *standard* at DoALL.

it gives you the plunge-cutting advantages of 2 flutes . . . the fine finish of 4 flutes!

You can greatly cut your milling time and costs with this DoALL End Mill. One fast operation eliminates the need of both rough and finish cuts. No extra cost for this DoALL double-feature advantage, either. Also available with ball ends.

Turning out your work faster is only the start of it. Like all DoALL End Mills, it will turn out the work longer as well. Special high-speed, high-strength DoALL steels is one good reason. So are all these others: DoALL End Mills are completely finish ground with polished flutes after hardening and have a high helix angle which promotes smoother cutting . . . spiral flutes are hollow ground for better chip removal and less abrasive action.



Radial ground double back-off design gives maximum strength on the cutting edge for highest speeds and feeds.

one of over 600 sizes — DoALL stocks many standards which are specials with others!

No compromising on *what* you want and *when* you want it with DoALL End Mills. Your needs are met completely and quickly from your nearby DoALL Sales-Service Store, where top stocks totaling over 600 different types and sizes are within one-call reach. Profit from this specialized end mill service now!

CT-37

FREE FOR YOU! The end mill speed selector chart that makes sense by saving time and chance of error! DoALL has put recommended speeds in *revolutions per minute*. A glance gives you your setup answer for every job. No cost just call your DoALL Store.

Find Your DoALL Store In The 'Yellow Pages'

THE DoALL COMPANY, Des Plaines, Ill.

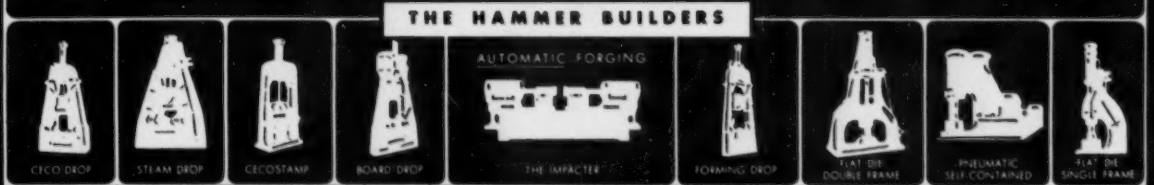
Call Your DoALL Service-Store

PRECISION DROP FORGINGS ARE PRODUCED CONTINUOUSLY AND AUTOMATICALLY

TODAY new principles, not unlike those which have revolutionized other segments of industry, have been applied by Chambersburg engineers to the forging process. The result is an entirely new concept of that process, pointing the way to greater productivity, reductions in unit cost, uniformity of product and assuring safer, cleaner working conditions. ● Automatic forging equipment, designed and built by Chambersburg, is at work today in a number of shops. ● Motion picture studies of these installations are available for individual executive or group showings. ● Let us assist you in your forging plans for tomorrow. A conference may be arranged through the Chambersburg representative in your area, or, if you wish, write or phone us at Chambersburg Engineering Co., Chambersburg, Pa.

CHAMBERSBURG

THE HAMMER BUILDERS



The Aluminum Man...

His "3-to-1" MAGIC

made metalworking history!

Thirty-eight years ago Alcoa introduced aluminum screw machine stock to the world. It was a historic occasion for manufacturers who found to their amazement that Alcoa* Aluminum Rod yields *three times as many finished parts per pound* as other basic metals. Today, *The Aluminum Man*—backed by more than a generation of practical experience* with Alcoa Screw Machine Stock—can work the same magic for you. He stocks a complete selection of alloys and sizes for immediate delivery. Fast service and technical help are available to you whether you need a few pounds or a few thousand pounds of Alcoa Aluminum.

ALABAMA
Birmingham
Hinkle Supply Co., Inc.
The J. M. Tull Metal & Supply Co., Inc.
ARIZONA
Phoenix
Ducommun Metals & Supply Co.
CALIFORNIA
Berkeley
Ducommun Metals & Supply Co.
Los Angeles
Ducommun Metals & Supply Co.
Pacific Metals Company, Ltd.
San Diego
Ducommun Metals & Supply Co.
San Francisco
Pacific Metals Company, Ltd.
COLORADO
Denver
Marsh Steel Corp.
Metal Goods Corp.
CONNECTICUT
Milford
Edgcomb Steel of New England, Inc.
Windsor
Whitehead Metal Products Co., Inc.

FLORIDA
Jacksonville
The J. M. Tull Metal & Supply Co., Inc.
Miami
The J. M. Tull Metal & Supply Co., Inc.
Tampa
The J. M. Tull Metal & Supply Co., Inc.
GEORGIA
Atlanta
The J. M. Tull Metal & Supply Co., Inc.
IDAHO
Boise
Pacific Metal Co.
ILLINOIS
Chicago
Central Steel and Wire Company
The Corey Steel Co.
Steel Sales Corp.
INDIANA
Indianapolis
Steel Sales Co. of Indiana, Inc.
KANSAS
Wichita
Marsh Steel Corp.
Metal Goods Corp.
KENTUCKY
Louisville
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LOUISIANA
New Orleans
Metal Goods Corp.
MARYLAND
Baltimore
Whitehead Metal Products Co., Inc.
MASSACHUSETTS
Cambridge
Austin-Hastings Co., Inc.
Whitehead Metal Products Co., Inc.
Roxbury
Eastern Metal Mill Products Company
MICHIGAN
Detroit
Central Steel and Wire Company
Steel Sales Co. of Michigan
MINNESOTA
Minneapolis
Steel Sales Co. of Minnesota
MISSOURI
Kansas City, North
Marsh Steel Corp.
Metal Goods Corp.
St. Louis
Metal Goods Corp.
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NEW HAMPSHIRE
Nashua
Edgcomb Steel of New England, Inc.
NEW JERSEY
Harrison
Whitehead Metal Products Co., Inc.
Hillside
Miller Steel Co., Inc.
Kenilworth
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Albany
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Buffalo
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Brace-Mueller-Huntley, Inc.
Whitehead Metal Products Co., Inc.
NORTH CAROLINA
Charlotte
Edgcomb Steel Co.
OHIO
Cincinnati
Central Steel and Wire Company
Williams & Co., Inc.
Cleveland
Nottingham Steel and Aluminum Co.
Williams & Co., Inc.
Columbus
Williams & Co., Inc.
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Toledo
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OKLAHOMA
Tulsa
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OREGON
Portland
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Philadelphia
Edgcomb Steel Co.
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Whitehead Metal Products Co., Inc.
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York
Edgcomb Steel Co.
RHODE ISLAND
Pawtucket
Edgcomb Steel of New England, Inc.
TENNESSEE
Memphis
Metal Goods Corp.
TEXAS
Dallas
Metal Goods Corp.
Houston
Metal Goods Corp.
UTAH
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Pacific Metals Company, Ltd.
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Aluminum Products—Hawaii, Honolulu 14, **HAWAII**

**Write Alcoa for new case-history kit telling why nine leading manufacturers switched to Alcoa Aluminum Screw Machine Stock.*

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

CALL THE ALUMINUM MAN

He's your Alcoa Distributor Salesman for sheet, tube, shapes, and other Alcoa Mill Products

Aluminum Company of America, 958-F Alcoa Building, Pittsburgh 19, Pennsylvania

READY FOR ACTIVE SERVICE. This hot-metal car is designed with a drop frame and trunnion stands for transporting a huge ladle of molten iron from the blast furnace. Car has a 55-ton capacity, and is 9'4" wide x 26'6" long. Trucks are AAR standard design and are for use on standard-gage track.

Hot-Metal Cars—built to last by a company that uses them

WELDING THE HOT-METAL CAR. Car is fabricated from rolled steel. It is all-welded and subsequently stress-relieved for extra-heavy duty.

Hot-metal cars are subjected to high temperatures and heavy loads as they carry their huge ladles of molten iron from the blast furnace to the mixer. But United States Steel designs and builds these cars to give satisfactory service for many years. It's only natural, because we use these cars daily in our own steelmaking operations, and we actually *know* what kinds of hot-metal cars serve best.

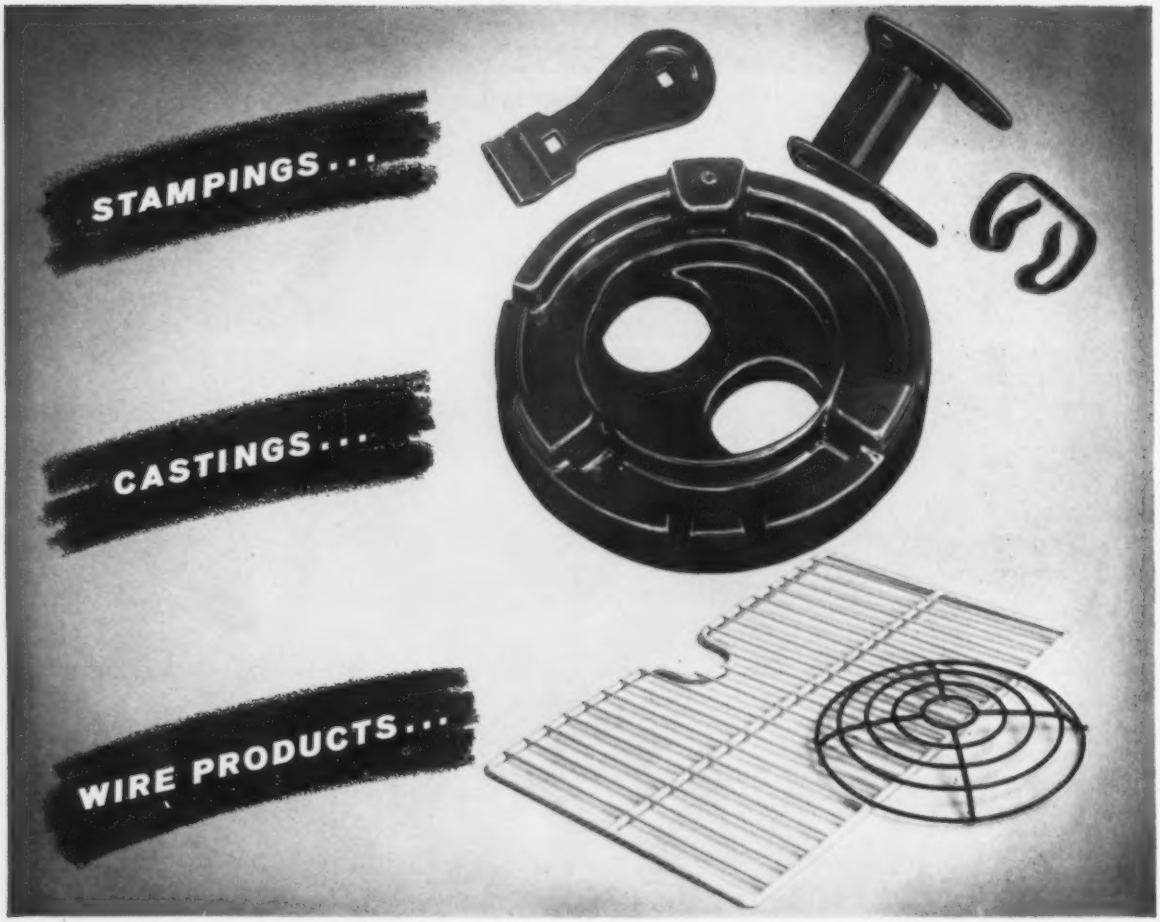
Shown above is a 55-ton capacity hot-metal car with a drop frame and rugged trunnion stands for supporting a ladle of molten iron. The car itself is fabricated from all-welded rolled steel, properly stress-relieved. Its side frames are six-inch rolled-steel plate, and the trunnion stands are eight-inch plate.

This car is equipped with air brakes for use in trains; it also has power hand brakes. Other variations are available in hot-metal cars. For example, cars can be designed to carry two pots, and they can be built with air-operated tilting mechanisms.

For information on many types of industrial cars, send for a free copy of our 32-page illustrated booklet—"USS Custom Designed Cars." And remember, you can call our engineers for consultation at any time convenient to you.

United States Steel Corporation - Pittsburgh
Columbia-Geneva Steel - San Francisco
Tennessee Coal & Iron - Fairfield, Alabama
United States Steel Export Company

USS TRADEMARK United States Steel



How many ways can you profit with new **CORVEL*** Fusion Bond Finishes?

No "ordinary" finish can match the challenging opportunities offered by CORVEL Cellulosic Finishing Powders.

CORVEL gives a premium appearance in beauty and controlled sheen—retains gloss and color. It assures uniform coverage even on sharp edges, corners, and projections. There's no worry about sag or drip marks, no bridging at intersections. And CORVEL finishes resist water, salt spray and sunlight—provide superior toughness, impact and abrasion resistance.

Parts can be clad uniformly in just one dip with thicknesses far exceeding those generally obtained with ordinary paints or enamels.

CORVEL finishes are applied by the WHIRLCLAD® Finishing Process. The heated object is dipped into a fluidized bed of CORVEL powders. The powders, which are in a state of "whirling suspension", assume flow characteristics similar to a liquid and bond by fusion to the part.

CORVEL Fusion Bond Finishes are resin powders of various types specially formulated for use with the WHIRLCLAD Finishing Process. This new production process for cladding metals and other materials with plastics is licensed exclusively in the U. S. and Canada by Polymer Processes, Inc., an affiliate company.

Write today for our new bulletin including data on all CORVEL Finishing Resins.

NATIONAL POLYMER PRODUCTS, INC. / Reading, Pa.

A subsidiary of The Polymer Corporation

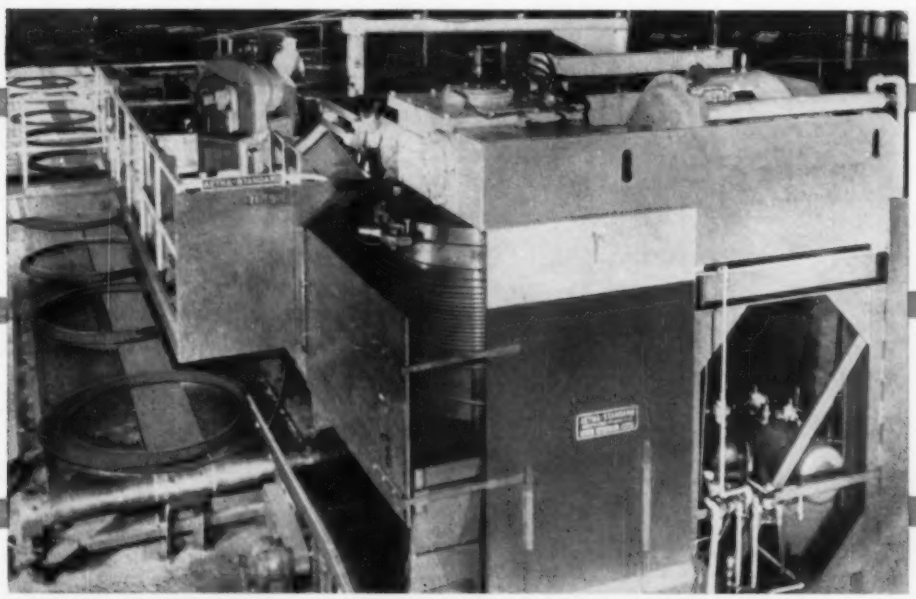
**Polymer Corporation Trademark for finishing materials*

POLYPENCO

ECONOMICAL PRODUCTION

OF THIN WALL, SMALL

DIAMETER TUBING



One of many Bull Block installations made by Aetna-Standard. Aetna's Bull Blocks range in size from 12" in diameter to 60" in diameter at speeds up to 2,000 feet per minute. Types—Horizontal, Inverted or Vertical.

Coil handling is most important for economy in production with a Bull Block. Aetna's engineers have concentrated on the method of moving the tube from the drum after drawing and the method of transferring the material back to the block. The payoff tray, the ease of entry, and the ease of gripping,ungripping and loading add to the economy of operation.

Our hydraulic feed gives absolute accuracy in traversing the die to the drum during drawing. Unique electrical controls give the operator instant control of speeds from zero to 2,000 feet per minute.

There's nothing new about the use of Bull Blocks. They have been in use for many years. But the design remained unchanged until Aetna-Standard, a pioneer in Drawbenches and other cold draw equipment, completely redesigned the Bull Block and made it a practical unit for high-speed production of small diameter, thin wall tubing. We have made installations for most of the major producers of copper, brass and aluminum tubing.

AETNA•STANDARD

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GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • RESEARCH LABORATORY: AKRON, OHIO

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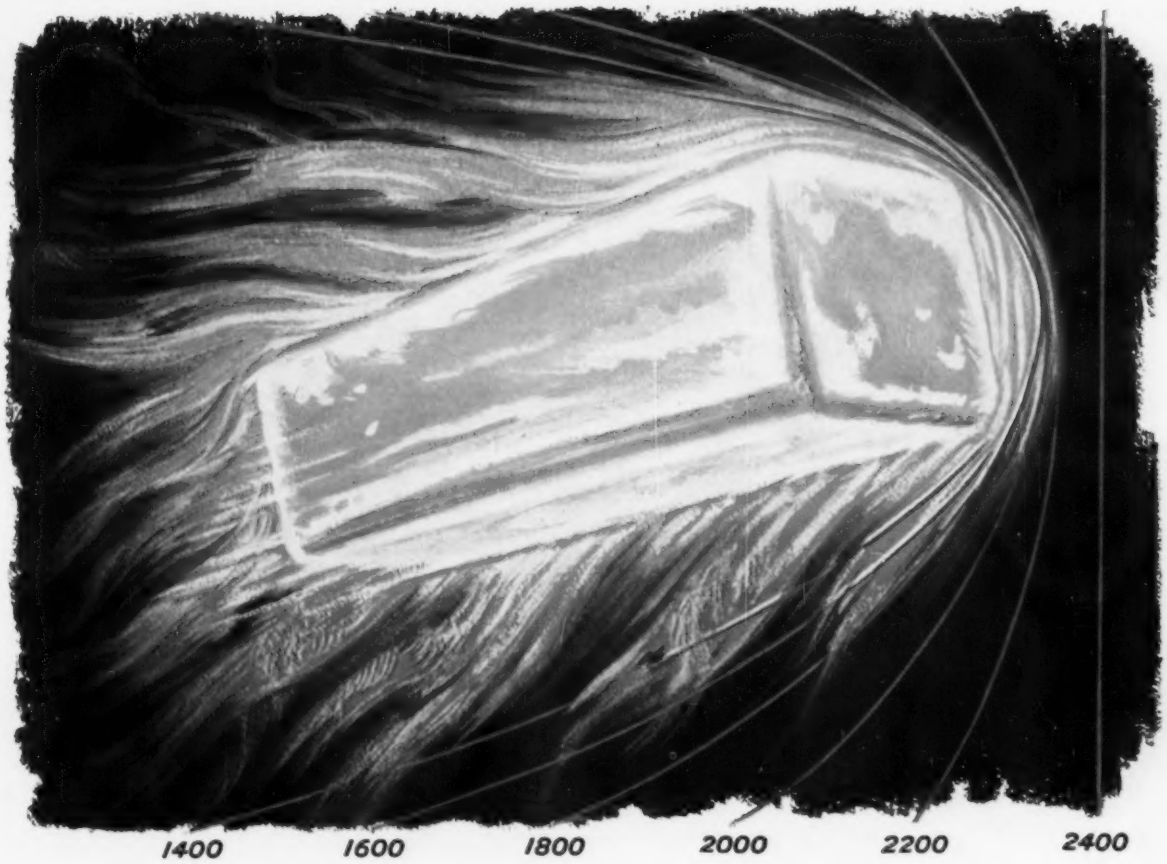
Welded Stainless Pipe
available from large
local stocks . . . real cost savings
at a time when costs are
hard to cut . . .

● Carpenter Welded Stainless Pipe saves you money on initial cost, but that's only the beginning. Because it's consistently more uniform, Carpenter Stainless Pipe provides service benefits that increase effective corrosion resistance and give longer life. Schedule 5, 10 and 40 stainless pipe is stocked by your nearby Carpenter distributor in quantities that assure you immediate delivery. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Carpenter

Stainless Pipe



Bending the Heat Barrier

Specialized mill equipment is available at HAYNES STELLITE for rolling high-temperature alloys into a variety of shapes and sizes. Bar (above) is being produced on a 24-inch mill.

High strength plus resistance to oxidation, creep, thermal shock, and fatigue—are some of the properties that have helped to push the heat barrier back over the past 15 years. These are the properties found in HAYNES high-temperature alloys. Properties that make these alloys very useful in the 1000 to 2000+ deg. F. range.

Typical uses? The really hot spots in jet aircraft, ramjets, and missiles are some. Furnace components, heat-treating equipment, kiln liners are others. In fact, any part where long service life under severe high-temperature conditions is essential.

There are 12 HAYNES high-temperature alloys—available immediately in convenient forms that can be readily fabricated. For information on properties and prices, write for descriptive literature.

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation

Kokomo, Indiana

UNION CARBIDE

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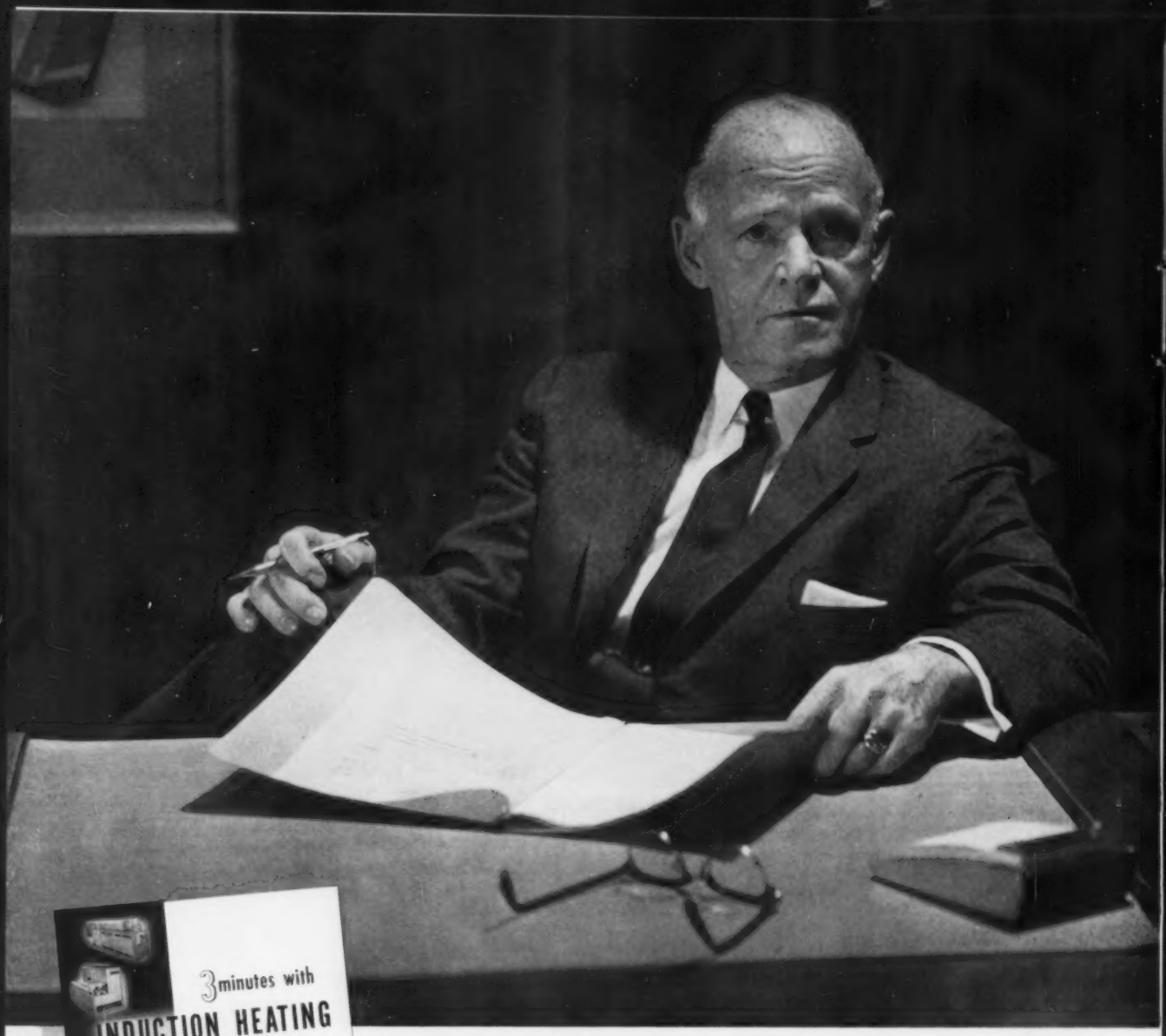

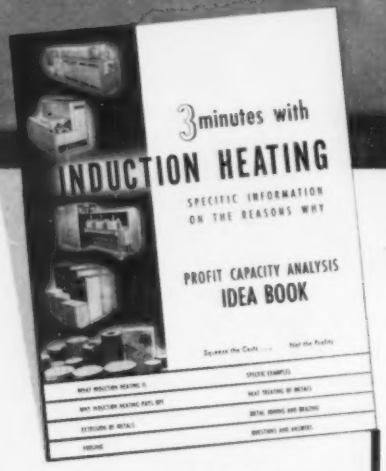

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MAGNETHERMIC'S Profit Capacity Analysis

. . . puts the squeeze on Costs . . . not Profits

If the pressure's on **you** for profits, put the "heat" on finding hidden production costs. MAGNETHERMIC Induction Heating installations are helping cost-conscious management leaders in many industries reduce costs, improve quality, and increase production through automation. Its adaptability in such operations as extruding, metal joining, forging and heat treating, to name a few, can be a major cost-cutting tool for you . . . a MAGNETHERMIC analysis will quickly find the possibilities.

MAGNETHERMIC offers skilled engineering to help custom fit its equipment to your applications. For a quick return on your investment, 5 minutes with this new booklet will show you how to put the "heat" where it belongs . . . on Costs . . . *not Profits.*

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Engineering Idea Leadership in Induction Heating

60 to 450,000 CYCLES

South cantilever section and part of suspended span erected; work begun on north tower seen in background. Total length of new bridge is 3350 feet, four lanes wide. Designer: California Division of Highways. Fabricators and Erectors: American Bridge Division, United States Steel.

Going up:

The bridge in which USS "T-1" Steel saved $800,000

The Carquinez Strait Bridge is the first major bridge use of USS "T-1" Constructional Alloy Steel, the first large bridge in which all truss members were fabricated by welding, and unique in that the specification of an alloy steel saved $800,000 in construction costs alone.

Like its 31-year-old counterpart, it will connect the San Francisco Bay area with the Sacramento Valley. In profile, the two bridges look like twins, but are vastly different in construction. First, to build the wider, heavier bridge without exceptionally massive members, a weldable, tremendously strong steel was needed. USS "T-1" Steel's yield strength (100,000 psi minimum), combined with its weldability, filled the bill—cutting weight of some members by nearly one-half their equivalent A242 design, and saving $800,000.

Second, welded construction in the new bridge will greatly minimize maintenance expense. It costs about $70,000 yearly to clean and paint the old bridge. By getting rid of thousands of vulnerable rivet heads, edges, lacing bars and angles in the new bridge, members will be less susceptible to corrosion and far easier to maintain and paint.

All in all, 2910 tons of "T-1" Steel are used in the bridge's most heavily stressed members. Also used: 5370 tons of USS TRI-TEN Steel, a weldable high-strength low-alloy steel, and 6440 tons of structural carbon steel. Each of these steels—all available from United States Steel—plays an important role in the bridge, helping to make possible the "most bridge for the money."

For more information. Write for our comprehensive books entitled "T-1" and "TRI-TEN." You'll find in them a wealth of engineering and metallurgical data. Or, contact our nearest representative—you'll find him listed in the telephone directory. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS, "T-1" and TRI-TEN are registered trademarks

United States Steel Corporation - Pittsburgh
Columbia-Geneva Steel - San Francisco
Tennessee Coal & Iron - Fairfield, Alabama
United States Steel Supply - Steel Service Centers
United States Steel Export Company

USS United States Steel

Father and son total 70 years machining steel

At the U. S. Steel Homestead Forge Shop, you find a lot of men who carry on in the shoes of their fathers. Gus Seitz's father was a Journeyman Machinist for 30 years before he retired. Gus started in the shop when he was 16, worked as an apprentice, Journeyman Machinist, Inspector. After six years in Production Control, he moved up to General Foreman, a post he has held for 10 years. With 40 years of machining experience behind him, Gus supervises a staff of 256.

His most important job: see that the work is carried out to the customer's specifications, *on time*.

The forgings in the picture illustrate some of the scheduling problems that Gus has to solve. These are closure head flanges for a nuclear reactor—130″ OD, 88″ ID and 35″ high. Ingots were cogged, upset, punched and forged over a mandrel. Then they received the preliminary machining. Next came a quench-and-temper heat treatment to meet the physical properties needed by the reactor builder. Then followed about 10 days of testing for microstructure, tensile strength and ductility. Finally, the forgings were scheduled back onto the 20-foot vertical boring mill for final machining.

With men like Gus Seitz riding herd on your USS Quality Forging order, you can rest assured that money won't buy a better piece of steel. U. S. Steel has the men, the know-how, the equipment and steel to turn out forgings for the most critical service, and we're eager to help you solve your forgings problems. Write for our free 32-page booklet on USS Quality Forgings. Send your requests to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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United States Steel

Easy Portability for

How U. S. Steel Supply's Any Steel, Anywhere, Any Time Service

"eliminates inventory losses"

reported by **Claude M. Turner,** Purchasing Agent
Standard Steel Corporation, Vernon, California

"We're using stainless steel plates to manufacture pressure vessels for missile-producing aircraft companies and process equipment for the chemical, mining and allied industries," says Mr. Turner.

"Carrying large in-plant stocks of stainless steel plates is quite risky, since specifications change rapidly, especially in the missile field. An unexpected requirement change might leave us with a costly inventory of dead stock.

"However, by using U. S. Steel Supply's Any Steel, Anywhere, Any Time Service, we have eliminated this dangerous possibility. We know from experience, that, regardless of quantity or demand, U. S. Steel Supply can deliver just the material we need . . . when we need it."

Here's how this service can work for you!

If you would like to see how other steel users are saving money and increasing profits as a result of Any Steel, Anywhere, Any Time Service, write to U. S. Steel Supply at the address below. There's a good chance our representative can help *you* eliminate idle equipment, increase production, and cut inventory costs.

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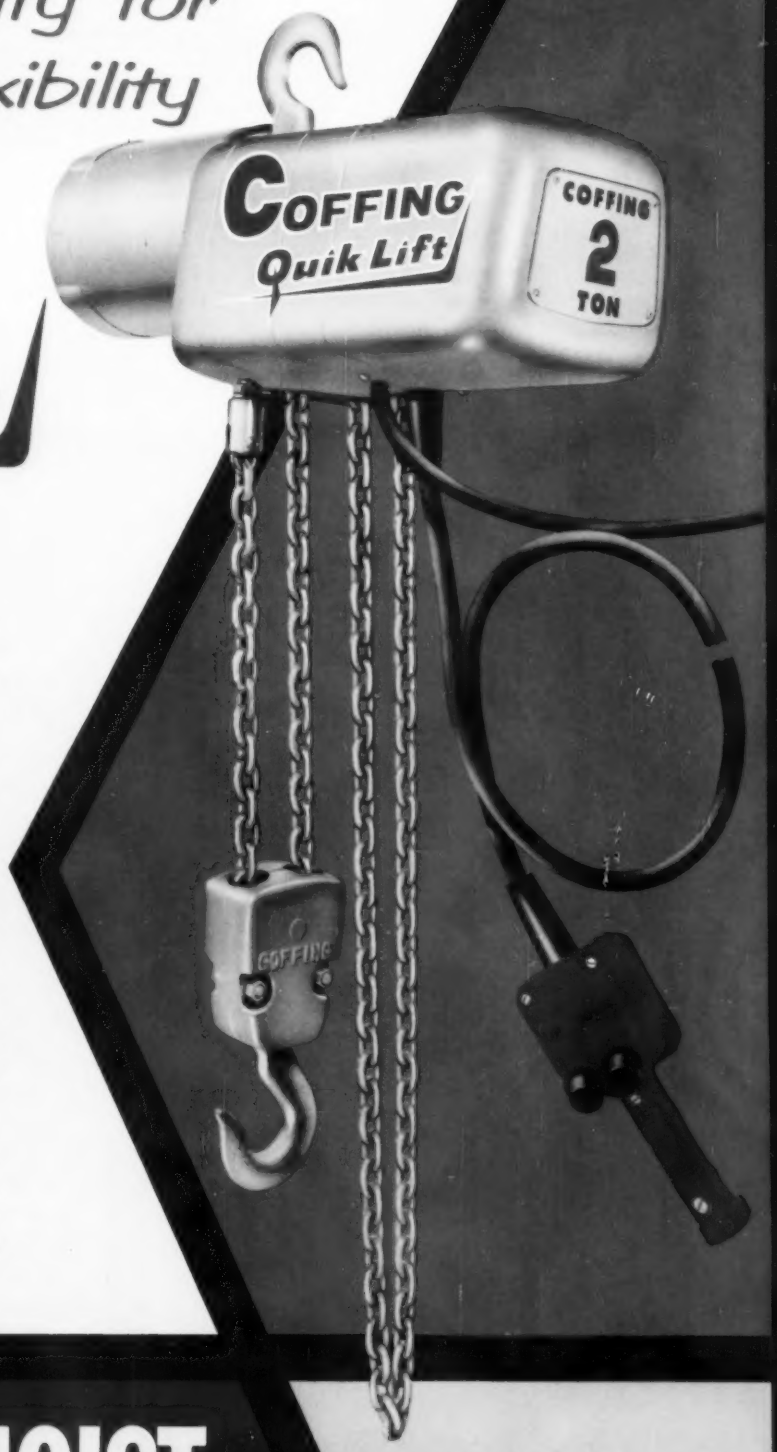
Use of a die-cast aluminum housing reduces hoist weight without any loss of strength or durability, making the hoist easily portable. Voltage changes may be made by changing just seven quick connect terminals on the easily accessible terminal block. Converting from single to double chain lifting, rechaining, or converting from hook to lug suspension is accomplished by removing three bolts and shifting or replacing the suspension unit. Adjusting the limit switch for a new lift can be done quickly by moving two nylon nuts to the correct positions.

If you are interested in achieving flexibility in your hoisting operations, investigate the new Coffing Quik-Lift. Your distributor will be glad to give you complete details, or write for bulletin ADH-65.



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product: AUTOMOBILE TRUNK LID

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An automobile manufacturer was having difficulty finding a steel sheet that would take the severe fabricating required to make the trunk lid of a new model. The part called for a tough draw, and the metal flow was very restricted. Finish of the steel was also an important factor. No one could provide a steel sheet that would do the job without excessive breakage.

solution:

Inland came up with a special Drawing Quality Killed Steel, "job-tailored" for this part. The steel took the difficult fabricating operation... solved the problem... and permitted the manufacturer to get his new model automobile out on schedule.

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At your service soon . . . Inland's new Cold Mill and a 50% increase in capacity for cold rolled sheet products.

INLAND

Cold Rolled Sheets

Oil Cuts Own Leakage

Anti-leak oils are cutting leakage in some machine tool applications as much as 75-80 pct, it's reported. Although they carry a premium price tag, the savings in oil loss over a year's period is said to more than justify the added cost.

To Roll Wide-Flange Beams

Watch for additional wide-flange beam rolling capacity. Since existing structural mills can be altered to roll wide-flange beams and because the wide flange has been outstripping standard I-beam demand for several years, at least two producers have finalized plans to switch to wide-flange beam output.

Ceramic Coatings for Metal

While present day ceramic coatings can withstand heats up to 3000°F for short periods, new improvements are constantly raising the limit. One producer of the coatings predicts that improved techniques and growing volume will bring the coatings within the range of the consumer market before long in the form of ceramic coated automobile mufflers.

Advice on Steel Orders

Steel users may be disappointed if they are counting on placing late orders for June delivery. One mill now has as much tonnage booked for June as it shipped in all May. Last minute orders could prove a problem, since July prospects are not encouraging mills to melt extra steel. One prediction: some orders will miss the June 30 deadline.

Bearings in Aluminum Cans

A recent shipment of bearings for the Air Force arrived sealed in aluminum cans. Advantages of the aluminum container are weight reduction and corrosion resistance. The bearing manufacturer is considering offering its bearings canned in aluminum to the whole market. Packaging prices would be slightly higher, but almost infinite shelf life and reduced shipping weight are desirable, according to a company official.

Automate Tool Building?

So far only one major machine tool builder has succeeded in setting up an automated production line in his plant, it's reliably reported. He makes just one standard model machine, but quality and price are such that he can compete very favorably with foreign competition.

Need Power Unit for Moon

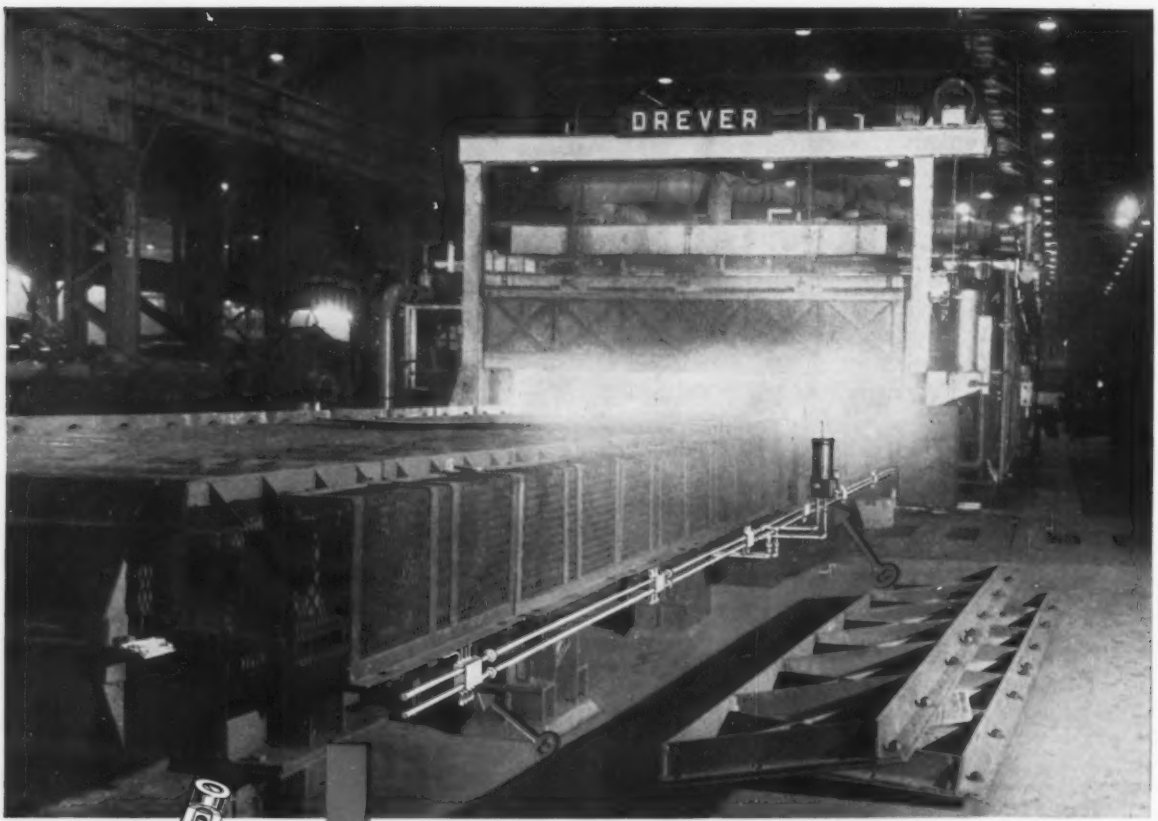
Launching of a U. S. earth satellite of around 3000 lb is at least a year away. Needed for the job is development of a reliable power plant that can boost an intercontinental missile. Power of that order is a must for the heavier satellite. Present boost capability for launching Navy and Army moons would be inadequate.

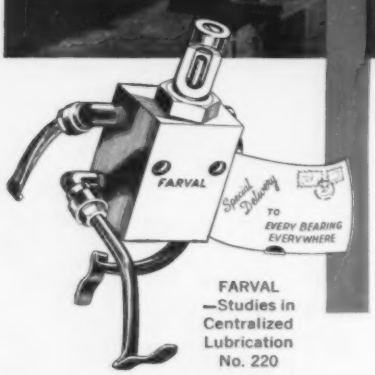
Electroless Method for Mg

Unlike previously-developed electroless-nickel processes, a new method nickel-plates magnesium, as well as other metals, including steel, aluminum and copper. The process is expected to prove useful in such applications as electronics equipment, printing cylinders and plates and other surfaces requiring wear resistance. It should also find use in plating inside tubes and as a base for plating other metals.

Outer Space Comes of Age

Political interest in outer space is growing by leaps and bounds. A bill is being backed to set up a permanent House committee to investigate space problems and to write legislation regulating its use. A 25-member committee is being planned which would make it one of the largest in either branch of Congress.





FARVAL
—Studies in
Centralized
Lubrication
No. 220

Farval system provides continuous, precision lubrication for huge heat-treat furnace

A MODERN Farval centralized lubrication system guards against premature bearing failure on both the approach and delivery tables of this huge, new 135-foot-long Drever continuous heat treating furnace now in operation at United States Steel's 160-inch plate mill. Its function is to harden armor plate, USS T-1 alloy and stainless steels—up to 45 feet long, 13 feet wide by 2 inches thick.

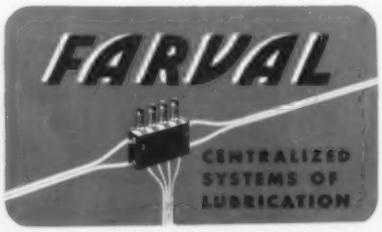
Farval's fool-proof Dualine system delivers just the right amount of clean lubricant to every bearing at regular intervals—from a safely located central station.

If you desire, we will have one of our specialists show how Farval centralized lubrication systems can save production hours, maintenance and labor in your own plant. Write today for revised Bulletin 26-S—it tells the complete Farval story. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION

—wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know industrial equipment, such as this heat-treat furnace entry table, is being properly lubricated.



Union Growth Lags as Automation Begins to Take Its Toll

Labor Mounts White Collar Drive to Recoup

Brace yourself for organizing drive tailored to white collar psychology.

Union leaders focus on salaried workers to recover lost ground.—By G. J. McManus.

▪ Within the next three weeks, United Steelworkers of America will hold a conference in Tennessee. The session will kick off a new drive to organize aluminum office workers.

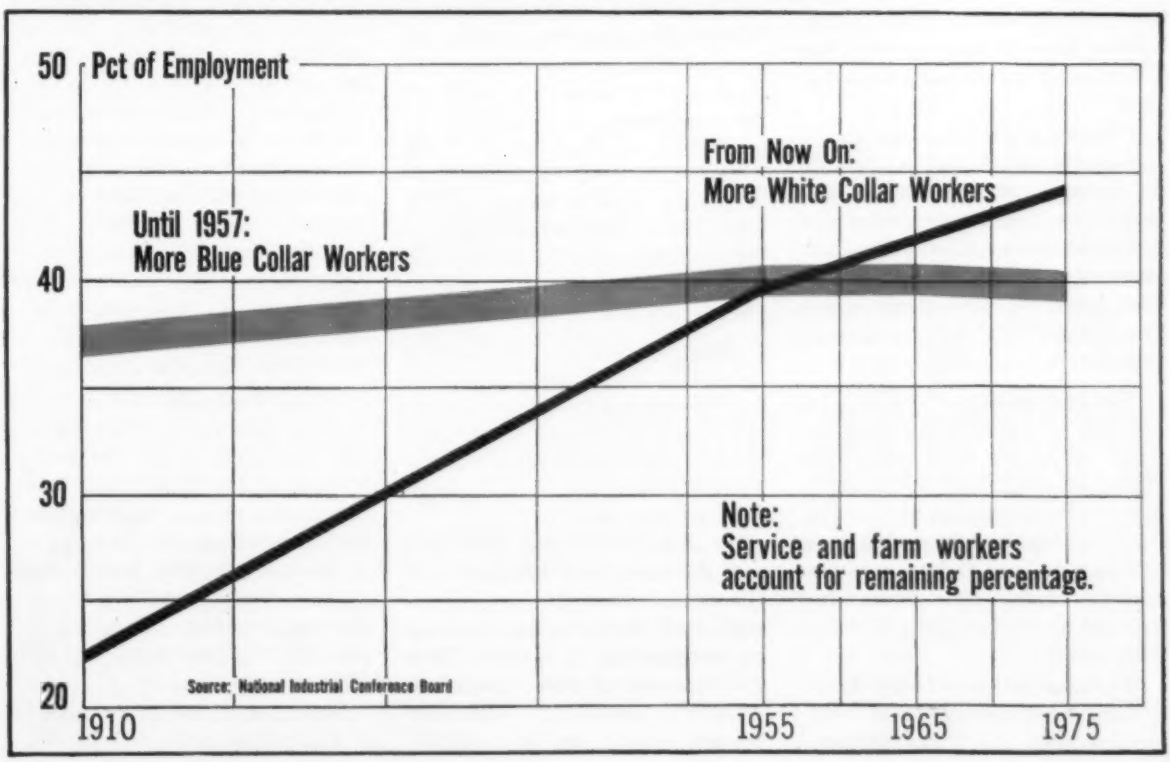
Behind this drive is a startling fact: Much of aluminum's explosive postwar growth has come without any addition of production workers. Over the past 10 years, one major producer has doubled sales. In the same period, year-end employment increased only 6 pct—from 47,000 in 1947 to 49,000 last year.

All the employment gain was in the salaried force, which jumped by 5000. The number of hourly workers actually dropped — from over 36,000 in 1947 to less than 33,000 at the end of last year.

Industrywide Trend — Market dips may exaggerate the change but there is a clear trend in aluminum and all industry. Automation is enabling plants to increase output much faster than employment. This is bringing a shift in the whole labor force away from manufacturing. Within industry, it is bringing a shift

The Changing Employment Picture

More White Collar, Fewer Blue Collar Workers in the Future



away from blue collar production jobs and into white collar work.

Hardest hit by this swing are labor unions. Their strength and growth have come largely from the blue collar worker. With the blue collar force standing still, union membership is doing the same. It's estimated union enrollment has been holding around 16-18 million for the past five years.

A Losing Proposition—Top leaders know very well that labor is really losing ground if it marks time while the rest of the economy expands. Eighteen million members represented 40 pct of the non-farm work force in 1950; they represent only about 30 pct today.

Union leaders know also it will be a tough job to recruit a larger share of the blue collar force. Only about 25 pct of the production group remains unorganized. But most of the non-union blue collar workers are in small shops (97 pct in plants under 50, according to a UAW survey). It is difficult for unions to reach them, expensive to service them.

White Collar Target — For big gains, labor must unlock new territories. If they are to have a future, unions know it must be with the white collar worker to a growing extent.

"We must get office and technical people into the union if we are to maintain our bargaining position," says United Steelworker vice president Howard Hague. The Autoworkers' Leonard Woodcock has said much the same thing; unions must attract white collar workers or lose power.

The New Strategy—This thinking recently brought a hasty redeployment of labor's battle lines. The Tennessee conference is just one effort in a broad program of white collar organization. Union men have suddenly realized they were watching the wrong door when they guarded against the direct effects of automation.

Technical progress is not downgrading or displacing union members; in effect it is bypassing them. From 1947 to 1957, industrial production zoomed 43 pct. In this same period, production employment of manufacturers showed practically no change. Automation brought a plentiful supply of goods without any need for more plant workers. (See Chart.)

Where New Workers Went—The effect was to divert manpower away from industrial production. Ten million new workers poured into the labor force in the 10 year stretch following 1947. Most of the addition was outside of manufacturing; virtually all of it was outside the production phase of manufacturing.

New workers were soaked up by an expansion of service, finance, government and trade functions. In the 10 year period following 1947, service employment jumped 25 pct; government employment, 30 pct; trade, 20 pct. By 1956 the number of non-production workers in the country exceeded the production group for the first time in history.

Behind The Change—Within industry a similar process is operating. Things like withholding taxes, pensions, and incentives have beefed up the accounting workload. Industry is spending staggering sums on research. Communications, illumination, color dynamics, are a few of the new functions in industry.

These and other services have added about 1-million men to manufacturing payrolls in the past 10 years. Plants have boosted non-production employment about 40 pct in a period when production employment was increasing less than 1 pct.

Quiet Revolution — Automation has had a revolutionary impact on employment but the change has been so smooth it escaped notice until recently. One reason for this is that there has been little actual displacement of plant workers.

In steel, for example, more than half the work force had been employed more than 10 years at a recent count. Moreover, there has been no downgrading of workers. Steel job rates showed little change in a 1956 study covering five years. The average worker was in a slightly higher classification at the end of the period.

Secondly, wages have climbed even faster than productivity during the postwar automation. Earnings of plant production workers jumped about 50 pct from 1947 to 1957. Part of the gain was lost to inflation but there was still a sharp hike in buying power and living standards.

Trend Continues — Economists say this meant a new demand for services. People could afford more entertainment, more travel, more carwashes. Their desire for these things helped provide jobs for 10 million workers.

The whole trend is expected to continue. By 1965, there will be an estimated 30 million white collar workers against 29 million blue collar. By 1975, the mix will be 36 million white collar men against 33 million blue collar.

What's It Mean? — Does this mean unions are on the skids? Some labor relations men say it does. They say the office worker and his technical cousin will never warm up to organized labor. They say the union is basically a plant animal, drawing strength from community effort and anchored to a position of hostile separation from management.

On the other hand the white collar worker is pictured as an individualist—a man who lives by a doctrine of individual performance and individual reward. According to this line, the office guy is closer to management, less angry with it and more trustful than the plant man; he identifies himself more closely with the company.

Union Viewpoint—Unions reject most of these notions. They concede that the white collar worker has misconceptions about labor. They recognize a need for education and special handling. But they see no basic incompatibility. It boils down to job protection and job benefits, they say; the white collar worker can be shown that unions will help with both.

Results so far are inconclusive. In 174 elections conducted in 1955

and 1956, office workers split about evenly on the issue of unionization. Unions won bargaining rights in 80 contests and lost in 94. About 5100 voted for unions; 4800 voted against.

Clumsy Tactics — Many of the union efforts so far have been heavy handed and misguided. Organizers have come into offices with standard leaflets, designed for plant workers. They have waved red flags and talked wildly about bread lines.

In one drive, attacks on a highly respected executive drew a sharp reaction against the union among employees. Workers at one progressive plant were annoyed by statements that they were being mistreated.

"They used the wrong pitch—the wrong tone," said two labor relations men whose employees recently rejected unions.

"Labor will have to tone down its anti-management approach if it expects to attract white collar workers," says another authority.

Union Leaders Alert—Top labor men are well aware that new methods are needed. Congressional investigations diverted their attention and the recession has made all organizing difficult. But they are beginning to move. In December the AFL-CIO held a white collar conference in Washington, D. C. The union organizing department has set a goal of 13 million white collar workers.

Individual unions are stepping up their drives. United Steelworkers now represents 50,000 salaried office and technical employees. The union has a separate contract with U. S. Steel covering office workers (all in plants). It has added some 30 locals in the past year for a total of more than 200 in the office and technical field.

Steel Labor Moves—The Steelworkers have specific organizing drives going at Green River Steel, at Bethlehem Steel in Seattle and among the can companies. In addition to the conference in Tennessee, they are moving in force to Birmingham, Ala. There they are out to organize the headquarters group at U. S. Steel's T.C.I. Div., among others.

Directed by John Pastin under Howard Hague, the general white collar drive of the Steelworkers bears little resemblance to organizing pushes of rougher times. Don't expect sound trucks, posters, and mass meetings.

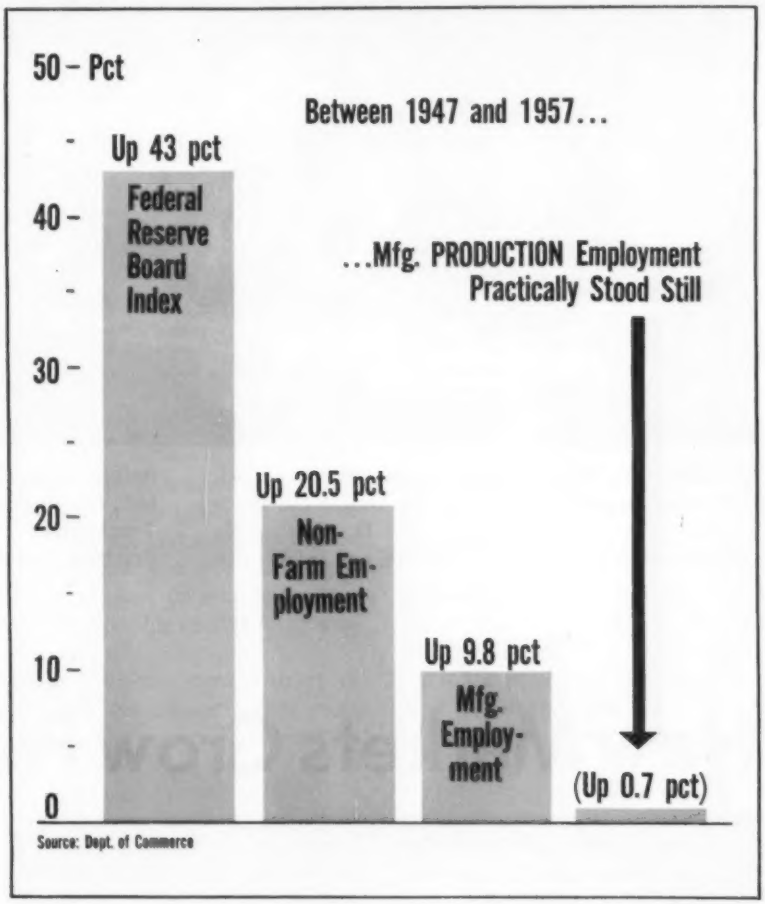
The Steelworkers start by training men from each district in the problems of white collar organization. There are today 45 specially schooled organizers.

Problems For Industry—For industry, the white collar drive is going to mean problems. The kind of sticky situation that can arise is shown by current split at one steel mill. Part of the office force is organized; it is working five days a week. The non-union portion has been cut to four days.

Most industrial relations men are firm in their attitude toward white collar unions. They don't want them.

"The variety of jobs and people in the salaried force calls for individual treatment," says the head of one industrial relations department. "It's better for the company and it's better for the man. And when you must deal with organized groups, you can't maintain the same flexibility."

Why Labor Leaders Are Worried



Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

DISCUSSION: Missile panelists, from left, were H. H. Howard, Caterpillar Tractor Co.; M. W. Nesbitt, Pesco Products Div., Borg-Warner Corp.; D. C. Romick, Goodyear Aircraft Corp.; W. F. Gore, and J. Gilchrist, Aerojet-General Corp.; Dr. J. Lux, Haveg Industries, Inc.; Dr. A. Scurlock, Atlantic Research Corp.; H. L. Thackwell, Jr., Grand Central Rocket Co.; and H. Reinberg, Lockheed Missile Systems Div.

New Markets Grow From Missiles

Products and processes developed from missile research have a big commercial potential.

But some established production materials may be by-passed by new developments in other products.—By N. R. Regeimbal.

▪ Missile research is going to open a vast range of new commercial markets. But it is also going to bring some strong competitors for existing products and raw materials, including steel.

This is the consensus of some of the country's top industrial space age pioneers attending the first national missile industry conference in Washington last week.

Moving into Industry—Such missile system components as hydraulic pumps, valves, fueling equipment, and servo mechanisms are already replacing existing equipment in industrial operations, particularly where hydraulic power is used. A new fluid transmission and gear pumps developed for hypersonic "birds" are being used in machine tool operations, these experts say.

Missile and rocket research and development programs, a nine-man panel on commercial applications agreed, will result in new civilian sales for industry in two ways:

Everyone Benefits—Components developed for missiles and rockets will become commercial products themselves, and improved technology for commercial products will result.

Over the long run—25 to 35 years—commercial use of entire missile vehicles for transportation, communication, and other purposes, will open new markets for metals, plastics, and other materials.

Materials Needed—But the demands of missile age technology will also mean the development of new competitors for existing products and materials. While metallurgists are attempting to develop easily-machined metals that will stand up at temperatures ranging up to 2000°F, missilemen are looking to new high temperature plastics.

Improved gages for automobiles, heavy equipment, and industrial uses are among the new products the missilemen believe will be developed as a result of missile and rocket research.

Will Go Commercial—The Industrialists, mostly from firms directly in the missile business, are convinced that missiles as such will develop into standard commercial products. Large rocket - boosted glider missiles, they predict, will in a quarter century or so haul people, freight, and mail across countries and continents. Smaller ones will be used for weather research, cloud seeding, and perhaps even crop dusting. Rockets and man-made satellites may someday be a vital

link in our communications and map-making systems, they say.

The three-day conference, sponsored by the American Rocket Society and the National Rocket Club of Washington was attended by 500 businessmen.

Small Business Bill Gets Support

Congress is drafting legislation giving special tax relief for small firms amid a general belief of leaders of both political parties that some help should be granted.

President Eisenhower and Democratic signal-callers after jointly ruling out general tax cuts, are committed to approve small business legislation.

There is general agreement among congressional leaders that the small business tax cut bill won't be allowed to get tangled up in the remnants of drives for special excise tax cuts or whopping personal reductions.

The small business bill will contain the only possibility of any change in depreciation laws this year. This provision will permit fast tax depreciation on purchases of used equipment, probably up to a limit of $30,000 a year, similar to benefits given new equipment purchases in the 1954 tax law.

Other provisions of the small business bill this year will permit some small firms to spread estate taxes over a 10-year period; permit some small corporations to elect to be taxed as partnerships, and grant larger deductions for losses suffered by investors in small firms.

Armco Mill Rolls

The new 56-in. hot strip mill at Armco Steel Corp.'s Butler Works is now in operation.

The $26 million mill, said to be the world's most powerful, will enable the Butler plant to hot-roll wider sheets of Armco's precipitation hardening grades of stainless steel. Electrical steels will also be produced by the mill.

Planning More Power

▪ General Electric's super high voltage transmission line literally will be looking for trouble in transmitting the highest voltage of any power line in the world.

The full-scale prototype transmission line to be constructed near Pittsfield, Mass., is designed to carry 750 kv, compared with the 345 kv, highest now in use in the U. S.

Problem to Solve—Project EHV (Extra High Voltage) is being constructed for the prime purpose of contributing technical knowledge to advance the transmission of higher voltages. In this sense, the purpose is to look for and solve in advance the problems that will occur when the time comes for wholesale planning of super high voltage transmission.

The company expects to prove that EHV systems are feasible, more reliable and more economical in transmitting large blocks of power over smaller rights of way than systems now in use.

A Big Market—Eventually, it is estimated that construction of EHV lines could create a $500 million, ten-year market for electrical equipment and power transmission components.

Also involved in the project is the Aluminum Co. of America, which will supply the cable. ALCOA's aim also is to gain experience in EHV transmission and to study and develop transmission cable for future EHV projects, which carry a vast potential for aluminum cable.

The project will cost $5 million in funds, equipment, and engineering talent. The Western Massachusetts Electric Co. is participating in the project and will later take over and operate the EHV line as part of its transmission system.

PROJECT EHV: Model towers of GE's planned super-high voltage transmission line dwarf scale model of conventional tower. Key people in the project are, from left, Julius H. Hagenguth, project consultant, Lynn Wetherill, manager of engineering for Power Transformer Dept., and Pier A. Abetti, manager of the prototype transmission project.

It Pays to Control Inventories

Inventories Can be a Corporate Millstone

Top management is paying closer attention to inventory control.

But the "how" of it is still an elusive goal for many companies.

■ Top management was figuratively rubbing its hands in expectation of a profitable year. Business was good and optimism was the by-word. Then orders began to fall off and the roof caved in. The expected profit melted away to a probable deficit. The reason: Excessive inventories in relation to the reduced volume of business.

Like the hapless company mentioned above, industry generally is learning—some times the hard way—that inventories can be a millstone around the corporate neck. The problem of maintaining inventories at a controlled level is getting closer top management attention.

Elusive Goal—But despite some progress, the "how" in management of inventories is still an elusive goal for many companies, according to a study just released by the National Industrial Conference Board.

Even worse, says NICB, too few companies "view inventories in a positive light and seek increased profits from inventory management rather than the mere avoidance of losses."

Stakes Are High—The growing importance of inventory control as a top management responsibility is brought home by the fact that last year trade and industry inventories hit $90 billion, or nearly 30 pct of invested capital. In the fabricated metal products industries alone, inventory investment was over $3 billion.

The cost of carrying inventory is another eye opener. For example:

It's Expensive — In 1954, when inventories were under close control, inventory cost to the appliance industry was $25.9 million over original purchase price. For fasteners, $2.9 million; machine shops $1.1 million; stamping shops $48.2 million; gray iron foundries $2.2 million. Total cost to industry: Over $1 billion.

Studies by IBM, General Electric, Westinghouse, International-Harvester indicate that inventory costs about 15-25 pct of its original purchase price per year. This is conservative. It does not include potential earnings capital might produce were it not tied up in inventory.

Cost of Capital—One large company estimates that its average capital dollar earns 18 pct. It also figures its inventory carrying costs at 18 pct. On this basis, every dollar invested in inventory costs this company 36 pct.

A major manufacturer switched to figuring loss of return on capital invested in inventory, then returned to figuring only inventory carrying costs; to compare the two systems. He now uses both inventory carrying costs and cost of return on invested capital in figuring inventory costs.

Inventory Imbalance — Management apparently is aware of the factors that lead to inventory imbalance and is trying to do something about it, according to NICB, which lists these causes as:

Lack of a controlling policy or program.

Failure to delegate management responsibility.

Too much emphasis on historical information.

TOTE THAT INVENTORY: Vapor Heating Corp.'s 2500-3000 part inventory has been placed in specially designed lift-out fiberboard tote boxes. At inventory time, boxes are lifted from shelves and weighed.

Inability to forecast accurately.
Inclination to hoard inventory.
Difficulty of coordinating sales, production, and purchasing.
Need to accumulate inventories in advance of sales.
Too many items in the line.

Management Interest — NICB says that "companies that formerly gave little thought to inventory administration are showing a new interest because" (1) tight money has forced conservation of working capital, (2) recurring extreme inventory imbalances have embarrassed management, (3) there have been too many discrepancies between stated values of interim and year-end inventories, and (4) good service to customers was not maintained.

Inventory turnover as a measure of inventory management efficiency is being used by some companies.

How It Works—John A. Patton Management Engineers have used turnover in setting up an inventory control system for a jobber of oil country equipment, applying it to finished goods only. Inventory on hand at the start of the year is deducted from cost of material sold during the year. Year-end inventory is then divided into the cost of material sold to get an inventory turnover figure.

Total store inventories are added to total store expenses and to required profit to get a figure indicating total required return. Total return is divided by total store inventories to get the required markup. As inventory turnovers increase, markup decreases.

Metalworking Angle — John T. Dye and Line Material have also used turnover as an aid in checking inventory levels. Turnover is only a beginning tool, and it must be applied item-by-item to an inventory. But it's being used to determine active accounts in a jobbing foundry, as an aid in establishing inventory levels among distributors. It has even been used to check the levels of finished goods inventories in metalworking shops.

On the question of who should pull the strings in the matter of inventory management, NICB has this to say:

Divided Thinking—"Opinion is divided concerning the administrative level at which the management of inventories should take place.

"In smaller companies, it is common practice to delegate the responsibility of inventory administration to the treasurer or controller.

"Larger companies place inventory responsibility on either individuals, committees, or special departments. Companies with divisional operations usually center responsibility for inventory on the division manager even though the over-all program may be directed by a central organization."

On judging inventory levels:

Flexibility Wanted—"While some managements are content to judge their inventory situation by merely following the total dollar value of their inventories, others are seeking to establish standards of performance which can be used to measure adherence to their inventory objectives."

Some companies feel they are better off with a more flexible inventory policy than one with rigid rules and regulations, says NICB.

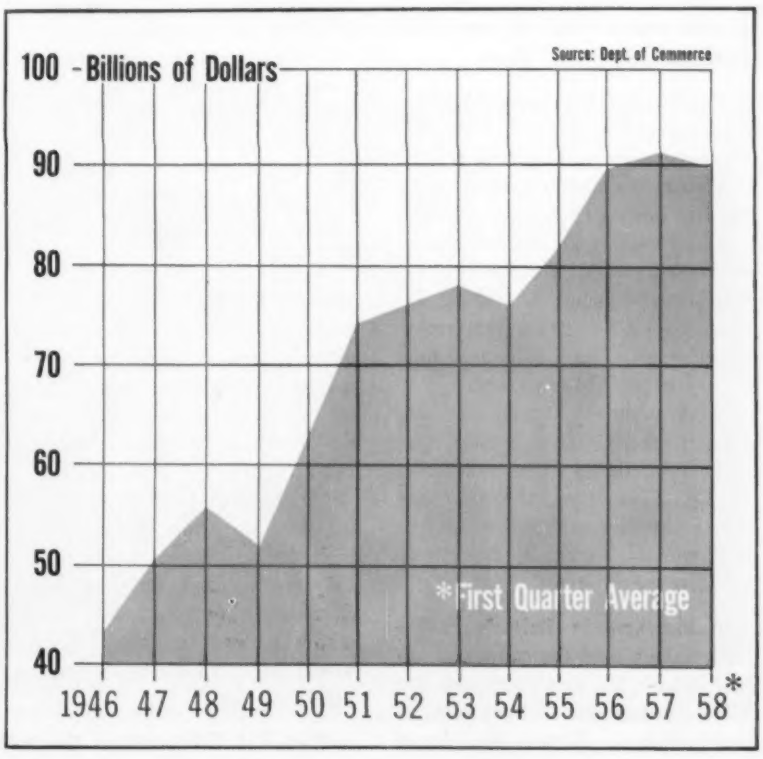
"While the managements of most companies favor good inventory control, the Conference Board study indicates that they have not always provided the degree of management influence that appears necessary for success.

No Written Policy—"Their desires are seldom supported by a written statement of policy or the expression of long-range fundamental beliefs which could serve as a guide to inventory management.

"In fact, some executives feel that a rigid inventory policy is either impossible to attain or not needed."

Inventory Problem Mounts

Book Value, Manufacturing and Trade Inventories.



NO CONTRACT: Louis G. Seaton, GM's top negotiator, announces labor contract termination.

STALLING: UAW's Reuther says his union will work without a contract, stalling for time.

Will Hotheads Kill UAW Plan?

Reuther's strategy is to avoid an immediate strike against auto companies.

But tense situations in the plants could lead to unwanted blowup.—By H. R. Neal.

▪ Can Walter Reuther hold members of his United Automobile Workers union in line long enough to gain a "tactical" advantage over the Big Three of the auto industry?

Faced with conditions amounting to industry-wide bargaining, the fiery little redhead is stalling for time. With contract expiration deadlines past, he is convinced time is now in the UAW's favor.

When company - union contracts expired, the situation would normally have called for a traditional, old fashioned strike. But this is not a year of tradition in the automobile industry — either in operations, sales, or negotiations.

Automakers in Driver's Seat—Automakers hold the economic upperhand for the first time since the UAW became one of their costs of doing business. Slow-to-no sales of new cars this year have held inventories to high levels. There are still about 750,000 passenger vehicles in stock, a supply adequate to withstand a lengthy siege at any or all of the companies.

GM's supply of new cars is the lowest of the Big Three at a still ample 45 days' supply. Ford's stocks stand at about 53 days supply. And Chrysler has a whopping 65 days supply, almost enough to hold its dealers to introduction time for 1959 models.

Who's Forcing?—So Mr. Reuther, tradition aside, has uncorked his union's newest and most novel design in strikes—a "work" strike, or "no strike" strike. He's betting his all the automakers "can't force us to strike."

Mr. Reuther realizes now is not the time to strike. Inventories are high, his strike fund is low. Plants only are working part time. Model shutdowns are scheduled to start within a week or two. Workers would lose both unemployment and SUB payments.

Wait Till Fall—But in the fall, the strategy is supposed to work out this way: New car inventories will have been reduced. Automakers will be trying to bring out their new models, and their competitive spirits will have been reawakened. It will then be time to resort to the time-tested whipsaw tactics of playing one company against the other. And if that doesn't produce a satisfactory contract—then a no-work strike.

However, success for the union's plan turns on a very thin thread—complete cooperation by all in-plant union members. After only three days of operating without a contract at GM, Ford and Chrysler, the thread was rapidly showing signs of fraying in two places—Chrysler and GM plants.

No Contract Provisions—In announcing intentions to continue plant operations without benefit of a contract, automakers informed employees the economic benefits, provisions of the contract would remain substantially in force. However, certain sections dealing with union and union activities were either

modified or eliminated. And it's in this latter category that weaknesses in Mr. Reuther's plan have emerged.

Among other things, the union shop has been abolished. Dues check-off has been eliminated. Changes have been made in the time allowed to handle grievances. It's this last grouping of changes which is showing signs of greatest wear.

Disputes Start — A dispute over work standards and safety hazards at a Fisher Body plant in Pittsburgh halted plant operations for a day. While the UAW claimed the walkout was not related to present contract negotiations, Mr. Reuther nonetheless dispatched two troubleshooters to the scene.

Trouble at Chrysler—But Chrysler looms as the real test of the union's no strike plan. Labor disputes have always been frequent and the company plays host to some of the most militant union locals.

Chrysler cut the amount of time shop committeemen and chief stewards can devote to settling grievances. Committeemen are allowed a maximum of 5 hours per day, chief stewards only 2 hours.

Work, What's That?—Shop committeemen and chief stewards, many long unaccustomed to work, balked at the new rule. After three days of "repeated warnings," they presisted in using the first hour of the shift to process grievances. On the fourth day of the auto industry's uneasy truce, Chrysler gave an estimated 200 shop committeemen and chief stewards a disciplinary layoff.

The same thing happened the next day. By mid-morning, only 230 chief stewards and shop committeemen remained in Chrysler plants. Another 112 had received disciplinary layoffs.

On the same morning, two stewards at Chrysler's Mack body plant, deposed by the reduction in union representatives, were sent home for refusing to work. With them went 100 other employees from the department in a wildcat, forcing Chrysler to close all Plymouth body and assembly plants in Detroit.

Machine Tool Show Gets Results

▪ A junior machine tool show sponsored by a single Cleveland distributor last week was pulling in visitors from as far as Florida.

Featuring over 60 machine tools worth $1 million from 19 builders, it was the largest known U. S. machine tool show by a single distributor in recent years and the most extensive show since the $20 million national show in Chicago in 1955.

Good Results — Results for the recession-hit machine tool distributor and builders apparently were worth while.

"This show has been a success beyond our fondest dreams," said Clare F. Kubek, Motch & Merryweather vice president. "You don't sell machine tools off the floor any more, so we didn't really expect to close any deals right here at the show. But we have developed some very active inquiries and are certain quite a few major orders are forthcoming as a result of the show."

Although more or less sandwiched between the last national show and the next one scheduled for 1960, it was budding with new developments, some stepped up just for the event.

New Developments — One machine in its world premiere was a high-speed $5500 Norton grinder which cuts grinding time 50 pct over predecessor types and up to 200 pct over some others.

Motch & Merryweather showed a new heavy duty vertical drilling and boring machine. An improved Blanchard surface grinder discharges chips and coolant to an outside tank for easy removal.

These are just a few of the new developments that were catching the eyes of customers and brought the hopeful list of inquiries.

LOOKING UP: Viewers with an interest at the M & M machine tool show were A. L. McKay, Cincinnati Bickford Co., left, R. W. Banfield, M & M president, right, and M. J. Hartman, Central National Bank of Cleveland.

How Customers Cue Press Design

Erie Foundry Uses Market Research to Advantage

To bring its products up to date, this company sought out opinions of its customers.

It found first hand information a better guide than hearsay.—By G. J. McManus.

■ Current trend in machine design is to let customers call the shots. Before they go ahead with a new model, design engineers ask the customer what he wants and what he doesn't want.

For this information, designers no longer rely on offhand opinions that trickle back from the field. They are making systematic, detailed surveys of the market. They are going out themselves to quiz operators.

Appearance Counts—A good example of the new approach to design is provided by Erie Foundry Co., Erie, Pa. Makers of forging hammers and presses, Erie began five years ago to step up customer research. A firm of outside designers was hired to survey the market and come up with recommendations for a new trimming press.

In 1954, the company came out with a radically different trimming press. It had a friction clutch and other new operating features. But the big difference was a streamlined appearance that contrasted sharply with the rugged lines of earlier models. Erie had found its customers wanted equipment to look modern. Automotive forge shops were particularly strong on clean, smooth lines.

Grass Roots Survey—In August, 1956, Erie Foundry went a step further. With another trimming press model under consideration, it sent design engineer Carl Reed on a tour of leading forge shops. Mr. Reed took with him a check list covering 23 major design points.

He talked to 13 forge shops representing about 30 pct of the potential market for the press. Piecing together their responses, he set out to design a machine that would have tie rod construction, heavy ram guides, windows in the side frame.

He eliminated side shears from the design and discarded the idea of knockouts. He kept to the idea of a smart, clean appearance.

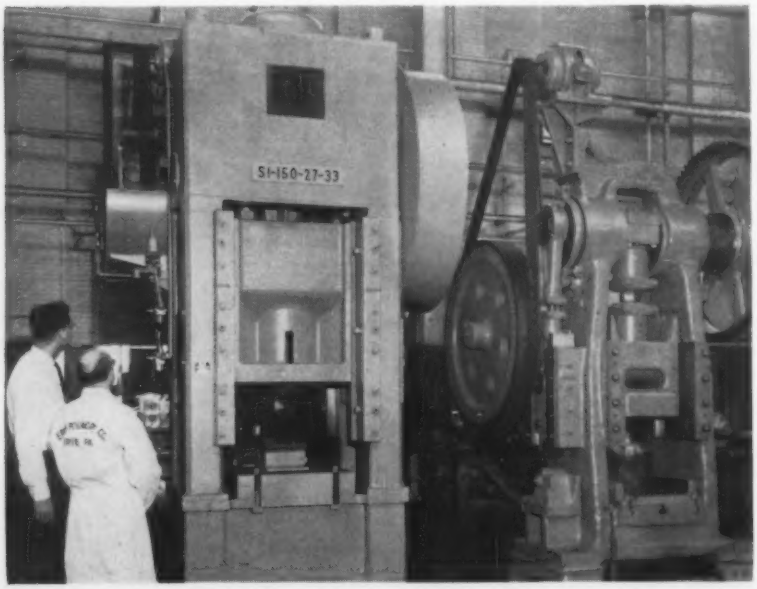
What They Wanted—Eleven out of 13 forge shops preferred tie rod construction to one piece construction. They had no special preference between welded or cast construction. Erie Foundry went to weldments for manufacturing reasons. Engineering changes could be made more freely.

Most shops had no special preference to guides, but said they wanted ample guide surface and provision for maintaining alignment without auxiliary devices or major overhaul. So Erie Foundry increased guide size 50 pct, provided two square guides for fixed base adjustment, and two 45° guides to take up front and side play.

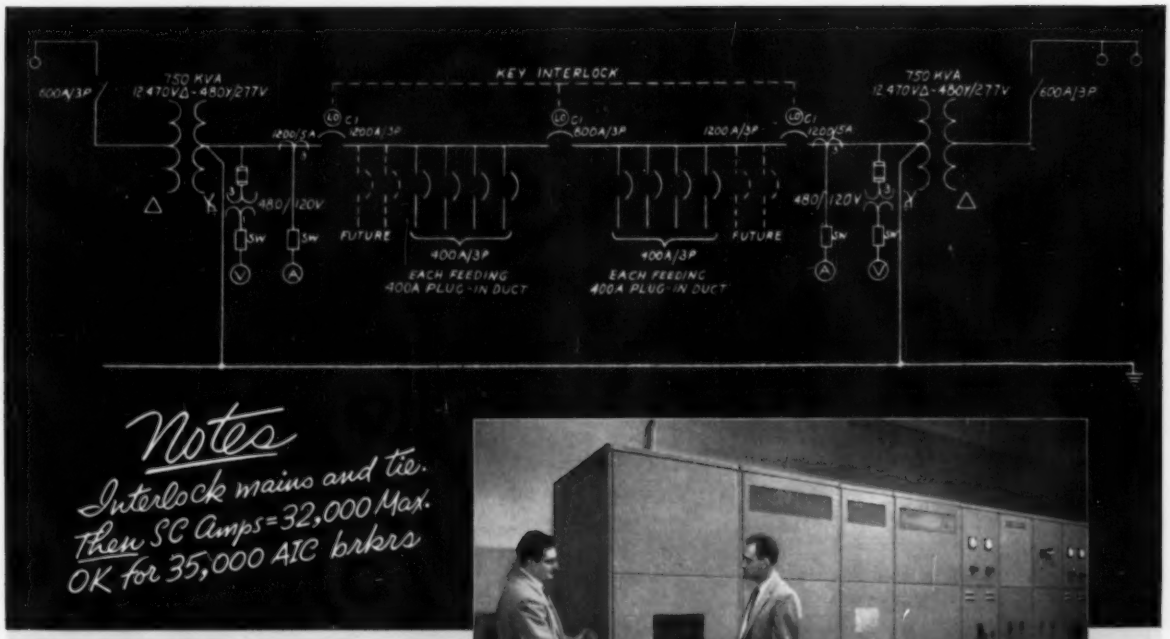
Side Shear Out Voted — Ten forge shops out of 13 said they did not need a side shear. On this basis, Erie Foundry eliminated the side shear, feeling there wasn't enough demand to continue an item that added $2000 to press cost.

Ten of the shops felt press should be from 30 to 40 strokes a minute. A few wanted higher speeds. The speed of the new machine was kept in the lower range.

A majority of the customers preferred a friction clutch to jaw clutch. Automotive forge shops especially were interested in windows in the side frames. Both these features were incorporated.



OLD AND NEW: Erie Foundry employees compare the firm's new 150-ton press, left, with its predecessor the old No. 14 trimming press. New machine is the result of a poll of forge shops using this equipment.



Notes
Interlock mains and tie.
Then SC Amps = 32,000 Max.
OK for 35,000 AIC brkrs

In Unit Substations COORDINATED DESIGN

Cuts Costs and Saves Space!

Square D designs and builds a complete line of substations for any application, indoor or outdoor—with dry or liquid-filled transformers—with large air breakers or molded case breakers—with motor control units.

A typical example is this 1500 KVA double-ended unit substation, designed to meet the special requirements of a Lexington, Kentucky, plant. Flexibility for future expansion and complete safety without service interruption were essential. The following features are incorporated in the unit:

Main breakers are 1200-ampere air circuit breakers

Feeder breakers used to feed Square D plug-in duct, are molded case breakers

Tie-in breaker is key-interlocked to permit tying units together when operating on one transformer in an emergency

Interrupting capacity of all molded case breakers exceeds the total maximum available short circuit current, including 100% motor contribution

By the proper application of molded case breakers, Square D engineers achieved a substantial reduction in both the size and the cost of the substation—and with no sacrifice in performance.

For the complete story of Square D coordinated design, write Square D Company, 6060 Rivard Street, Department SA, Detroit 11, Michigan.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

Progress in Metals Research

COMPUTER: Jones & Laughlin's new analog computer enables researchers and engineers to simulate complex metallurgical and mechanical processes electronically, saving many hours of involved mathematical calculation.

LABORATORY: Carpenter Steel Co.'s new corrosion research laboratory is expected to make valuable contributions to the knowledge of metals, particularly for critical applications as in atomic energy or missiles.

Barium Readies Mill Site

Barium Steel Corp. has exercised its option with the Pennsylvania Railroad and completed purchase of a 900-acre tract on the Delaware River in Burlington and Florence townships, New Jersey.

The company proposes to build a completely integrated steel mill on the 3200-ft waterfront property north of Philadelphia.

J. A. Sisto, Barium chairman, stated that site preparation and installation of certain utilities would start in the near future while awaiting completion of financial arrangements for the construction of the initial production plant.

This will consist of a blast furnace and oxygen converter plant to produce 800,000 ingot tons annually. Ingots will be shipped to the company's finishing mills at Phoenixville and Harrisburg, Pa.

National Steel Buys Crown Equipment

Why did Weirton Steel Div. of National Steel Corp. buy the cold reducing mill and tinning line of Crown Cork & Steel Co., Inc., at Baltimore?

Thomas E. Millsop, National Steel's president, said the equipment "will be utilized in the Weirton Steel Div. operations." The Weirton plant, one of the most efficient and up-to-date in the tinplate industry, is situated in West Virginia, near Pittsburgh.

Crown has been operating the equipment for 22 years. Industry sources say it's been up for sale for some time. Its production is limited to narrow widths that were once favored in can making. Its capacity is 155,000 tons annually, about half of Crown's needs. Today, container makers are all using wide sheets to reduce costs.

Crown, fourth largest canmaker in the industry, says that from now on it will buy all its tinplate from outside sources.

WIN YOUR CHOICE IN NEW PANGBORN CONTEST

Celebrating the successful introduction of new

Pangborn

Rotoblast® Steel Shot

FOLLOW THESE SIMPLE RULES:

1. Anyone employed by a company using blast cleaning equipment is eligible for this contest, except employees of Pangborn Corporation, its agencies or affiliates.
2. Check Rotoblast Steel Shot ad in this issue for answers and fill in missing words on the Official Entry Blank.
3. Sign your entry and mail to Pangborn Corporation, Hagerstown, Md. Entries must be postmarked not later than the 4th of July, 1958.
4. All entries with correct answers will be deposited in a container from which the lucky winner will be drawn and awarded his choice of Ford Thunderbird, Chevrolet Corvette or Plymouth Fury.

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PANGBORN CORPORATION, Hagerstown 6, Maryland

In new ROTOBLAST STEEL SHOT, voids and defects are virtually eliminated by a new shot manufacturing process called _____ Casting.

Continuous heat treating in a controlled atmosphere gives you _____ hardness and _____ life. Result: faster cleaning and lowest blast cleaning costs ever.

Name..... Title.....

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Need help filling in entry blank? See Pangborn advertisement on inside back cover of this issue.

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BRIDGEPORT "DEEP LUSTER" BRASS STRIP REFLECTS THE QUALITY OF YOUR PRODUCTS

If you use brass, copper or bronze strip where fine surface is a "must," you'll benefit from the beautiful, lustrous finish you get with Bridgeport Strip. Now coming from our new Sendzimir Rolling Mills, this new kind of strip reduces polishing time, improves plating and adds to the quality of your products.

In addition to its exceptionally fine surface, Bridgeport "Deep Luster" Brass Strip has remarkable uniformity of gauge and mechanical properties from edge to edge and from end to end. It's available in long-length coils for more economical production.

If you're not using brass strip now, it will pay you to consider its many important advantages over other materials. And with Bridgeport Strip you get the extra quality that Sendzimir rolling builds into it.

Ask any one of our 33 local sales offices for the complete story on this new strip, along with actual samples.

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Bridgeport Brass Company, Bridgeport 2, Connecticut
In Canada: Noranda Copper and Brass Ltd., Montreal

Harry D. Hirsch

Auto Supplier Bucks the Slump

Many companies in the automotive field are feeling the recession's pinch.

Not so with Mr. Hirsch's firm. It's sailing smoothly along at a record clip.

HARRY D. HIRSCH: He planned ahead of the recession.

▪ Saving sinking companies may not be his hobby, but Harry D. Hirsch made a "do-it-yourself" success of salvaging and rebuilding one of the oldest names in the automobile industry.

Four years ago, C. M. Hall Lamp Co. was on the brink of bankruptcy. Even though it was the nation's largest independent manufacturer of automotive headlight assemblies, Hall Lamp was sinking under the weight of competition and poor management. Then along came Harry Hirsch with a few dollars to invest and a hankering for a challenge.

The Big Decision—At first look, Hall Lamp appeared to be too much of a challenge. In the previous year, 1953, the company lost over $700,000 and employment was down to 113 compared to 400 now. But the longer he studied the company the better it looked.

He purchased 25 pct of the firm's outstanding stock and in February, 1954 took over active management as president. As he points out, "Hall Lamp was well known in the industry but nobody knew Harry Hirsch."

Choosing His Men—A native of Philadelphia and a graduate of the University of Pennsylvania's Wharton School, Mr. Hirsch considers himself a manufacturing man, not a business manager. To get the right men to do business with the auto industry, he turned to the auto companies themselves. All but one member of his present management team were recruited from the auto producers.

Then he started a $1 million modernization program, completed last year. Most important improvement was installation of a 450-ton press for stamping dual headlight shells from strip steel at the rate of 2000 units an hour. The best old rate was 500 pieces an hour.

Results — The investment paid off. For 1957, the Detroit automotive parts supplier reported a profit of $590,000, nearly triple 1956 earnings. Sales last year jumped to $9 million,—the highest level in the company's 49-year history. Despite the auto slump, Hall Lamp's sales this year are ahead of 1957.

The remarkable transformation of Hall Lamp from a near bankrupt company into a thriving business earned Mr. Hirsch a citation from the Free Enterprise Awards Assn. last year.

Cites Civic Duty—Despite seeming preoccupation with the recovery and expansion of Hall Lamp, Mr. Hirsch is very active in civic affairs. As he explains, "We are an integral part of the community. Consequently, we have a responsibility to perform the duties expected of every good citizen."

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cold rolled spring steel

The quality of your spring steel parts or products is only as good as the spring steel itself—its response, its performance. When you specify J&L it means all the advantages of most exacting quality control—from ore to finished coil. Particularly important is the opportunity to utilize J&L's Restricted Specification processing to achieve the qualities necessary for optimum end-results. With individual restricted specifications met, oftentimes production operations can be simplified and in many instances product quality improved. As an example look at this . . .

TYPICAL APPLICATION . . .

product

Hardened control bar

specification

Spring Steel
Analysis—AISI—1050 annealed
Size 4½" x .042
Tolerance ± .0003 including crown
Width tolerance ± .005
Temper—B78 Max.
Finish—#2
Coil size 250/300 lbs. per in. width

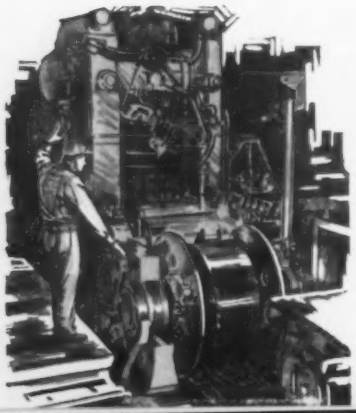
results

Uniformity of shape and gauge made possible change from cut lengths to coils, reducing handling and inspection. Increased speed of production line. Amazing thickness control eliminated 2 quality control stations.

J&L STRIP STEEL DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

Low Carbon	Electrolytic Zinc, Tin, Copper & Brass Coated
High Carbon	Alloy
Tempered Spring Steel	Stainless
Molten Zinc Coated (Jal Zinc)	Painted

The experience, facilities and accumulated know-how of a specialized organization devoted exclusively to strip steel processing are available to work with you. In this clearing house of strip steel engineering and application information, it's a good bet there is something of value for you. Your inquiry will get our immediate, interested attention.



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FORMERLY THE COLD METAL PRODUCTS COMPANY

Summer Slump Dims June Upturn

It's too much to hope for that the upturn noted this month will continue through the summer.

But FRB Index of Industrial Production may end eight months of decline in June.

▪ It can now be hoped that the Federal Reserve Board's Index of Industrial Production will hit its bottom in May and take a slight turn upward in June.

A better feeling all around and the undeniable pickup in steel production point to that possibility. It's not out yet, but some believe that May's FRB index may drop only a point from April and the real optimists believe it may hold the line.

Eight Months of Drop—The seasonally adjusted index held at 145 until August of 1957, then dropped a point in September. Since then, the decline has continued at the rate of two or three, or even four points a month to 126 in April.

But you may have to take whatever joy you can from the June pickup for at least a month or two. Right now, it looks like seasonal factors, and the unsettled situation in the auto industry, are too strong to be overcome through most of the summer. Some slight declines must be considered as probabilities in July and possibly into August.

Better in the Fall—This is not too discouraging a probability. The indications still point to a first-class upturn in late summer and early fall. Whether it continues for any length of time is now the critical factor.

It has been pointed out that consumption of manufactured goods has exceeded production for a period of months. Inevitably, this condition has to bring about an order upturn.

So far, except for the possibility of steel, that has not occured to any great extent. In April, the last month for which any valid figures are compiled, new orders from manufacturers continue to decline, and were less than the value of deliveries.

Inventory Factor—As a result, inventories continued to drop. As has been the case for some time, the decline continues to center in the durable goods area.

However, as the bottom of the recession approaches, the exact level of inventories may cease to have too much value as an indicator. Just as inventories continued to climb for weeks and months after universal cutbacks were ordered, they will continue to drop for some time after the bottom has been reached, as the result of a normal lag of inventories behind production. This is not yet the case, however, and inventory cuts still reflect management's intentions to trim stocks to the bare minimum to sustain current rates of production.

Are Price Critics Unfair?

A lot of unjust criticism is being aimed at manufacturing management as the cost-of-living index is pointed to as an indicator of inflation.

If you take a close look at the elements that make up the index, you will find that food, and, to a lesser extent, services, are far more to blame than manufactured products.

Some Are Down—The BLS index for all commodities is up 6.2 points from April, 1957 to April, 1958. But the index for food is up 7.8 pct, accounting for most of the total rise.

Home furnishings, where business competition has been at its stiffest, are actually down .9 of one point.

It's true that consumers are holding back on the so-called "easily deferrable" purchases of consumers durables. But it isn't entirely because of higher price tags.

Less Left Over—The average consumer, after paying much higher food bills, higher rent, higher taxes, higher medical costs, higher transportation, higher education costs — all items that can not be deferred— is certainly not encouraged to extend his credit for a new car or refrigerator.

If wage-price inflation is the principal cause of the recession, as many believe it to be, it will have to be licked at more than the manufacturing level.

Easy Financing

You will have very little trouble obtaining any kind of financing this year.

The money market, only recently at its tightest, has eased in most areas. Drops in interest rates have occurred particularly for short and intermediate business credit. Long-term financing is showing less easing, however.

As a result, the money market will be ripe for borrowing at good rates for corporations this summer and fall for replacing low inventories or other financing.

AUTOMOTIVE

Willy's Big Gamble Is Paying Off

After Dropping Passenger Car Line, Profits Climb

The Toledo Jeep manufacturer has no regrets about quitting the passenger field.

Its commercial truck business is proving to be highly lucrative. —By H. R. Neal.

■ Willys Motors Co. has managed to make money ever since it dropped its passenger car line in 1955 and concentrated on commercial vehicles.

Last year Willys contributed slightly more than $5 million net earnings to Kaiser Industries Corp. whose division, Kaiser Motors Corp., bought up Willys-Overland in 1953 for $60 million.

Jeep is Moneymaker—Practically all of Willys earnings were due to its line of Jeeps. In 1956 the Jeep earned $3.5 million. Earnings for 1955, the last year in which Willys and Kaiser passenger vehicles were produced, were $4.6 million — all from the Jeep.

By way of contrast, the combined Kaiser and Willys passenger car operations managed to lose $35.5 million in 1954 and $27 million in 1953. Willys still does manufacture a passenger-type station wagon but, technically, the station wagon is classified among commercial vehicles.

Price Slashing Hurt—When and why did Willys decide to get out of the passenger car business? Cruse Moss, sales vice president for Willys Sales Corp., says the automobile marketing picture underwent a drastic change late in the fall of 1954.

"Ford introduced 'giveaway' sales techniques and dealer profits dropped from 4 to 5 pct to under 1 pct. Strong dealers with high volume operations were able to survive. But the low volume independents couldn't hold on," he explains. "That's when we decided to leave the passenger car market to the high volume companies."

Willys, he recalls, felt its dealers needed to retain adequate profit margins if they were going to hold on to their franchises. And the company knew dealers couldn't get a large enough volume to make it attractive.

The Scene Changes—Willys dealers now average over $400 on a sale, counting the marketing of trade-ins, compared with less than half that amount for passenger car dealers.

The company now has 1500 dealers; added 50 new dealers last month, and expects to add several hundred more before the year is over. Many are dualed with larger, non-competing truck makes or with passenger car outlets.

By concentrating on commercial vehicles Willys has managed to stabilize employment as well as profits. In the first four months of this year its employment high was 4986 employes, the low was 4899. Over the whole of last year the high and low were 5621 and 5009 respectively. For 1956 they were 5666 and 4537; for 1955 it was 5638 and 5052.

Faring Well—According to Mr. Moss, the firm's U. S. volume is off only about 6 pct so far this year, while the entire commercial market is down about 40 pct.

Willys is producing its specialty

AIRPORT ASSIST: A Willys Jeep equipped with conveyor helps speed up baggage handling for an airline. It's one of the many specialized uses Willys assigns to the Jeep, the Toledo firm's No. 1 moneymaker.

You asked for it . . . .

AND HERE IT IS . . .

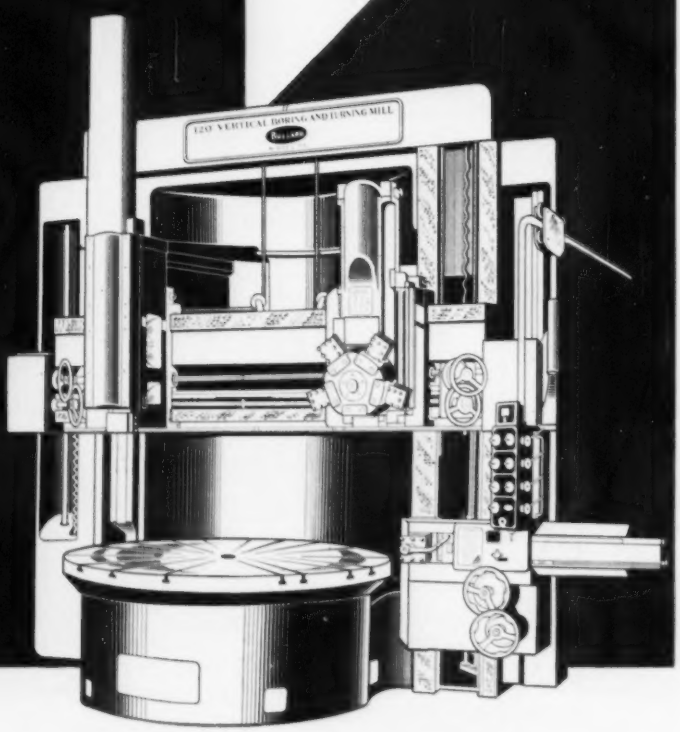
THE NEW

BULLARD 120"

VERTICAL BORING AND TURNING MILL

SWINGS 120" — TABLE SIZE 108"

Recognized for over seventy-five years as the leading builder of vertical turret lathes and boring mills, The Bullard Company has been repeatedly asked to build mills of a larger size incorporating the features of the Model 75 line.



The Bullard 120 Vertical Boring and Turning Mill is designed, engineered and built to meet this customer demand. Feature for feature — by comparison — you'll find it is the outstanding mill on the market today.

BULLARD

REMEMBER . . . to cut costs when cutting metal — Buy BULLARD

Check all the advantages — get the full story by calling your nearest Bullard Sales Office or Distributor.

THE BULLARD COMPANY
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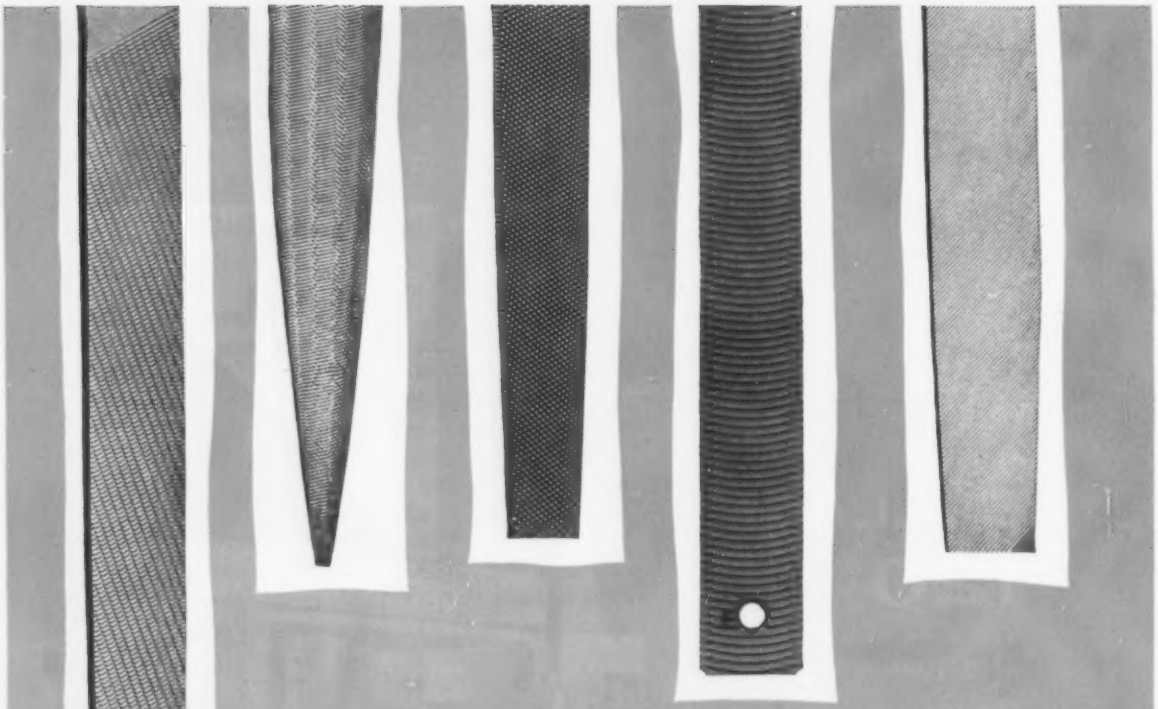

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NICHOLSON and BLACK DIAMOND FILES

A FILE FOR EVERY PURPOSE

Automotive Production

WEEK ENDING	CARS	TRUCKS
June 6, 1958	74,022	16,647
May 31, 1958	66,574	15,038
June 8, 1957	129,517	23,370
June 1, 1957	82,431	17,519
TO DATE 1958	1,978,700	393,000
TO DATE 1957	3,001,400	509,700

*Preliminary Source: Ward's Reports

vehicles at the rate of about 350 a day or 70,000 per year. In the first five months of the year, 33,852 vehicles have rolled off the end of its U. S. production line. This is 5000 more than were produced in the same period last year.

Willys manufactures three basic lines of "Jeep" vehicles, best known of which is the Universal Jeep. Next is the Utility Wagon, formerly the station wagon series. And about 18 months ago the firm introduced its Forward Control series of conventional trucks.

Rivals Model T—The Universal —and versatile—Jeep has changed little in outward appearance from its World War II days when it became the best known vehicle in the world, with the possible exception of Henry Ford's Model T.

However, Dean Hammond, engineering vice president, says steady improvements have been made in the vehicle line — particularly in frames and suspensions. Willys engineering efforts are aimed primarily at making each vehicle just a little better than the preceding one.

As there is no such thing as an "annual model change," these changes are incorporated into the production process as running changes whenever they are available. The last "big" styling change came in 1952 when the hood was raised and rounded to accommodate a larger, more powerful engine.

New Truck Line—In Dec., 1956, the Willys introduced its first line of vehicles designed specifically for the commercial market — the Forward Control series. Popularity of the FC vehicles is growing among Jeep buyers, and Mr. Moss reports they currently account for about 25 pct of domestic production. But he doesn't expect the new line to replace the old standby—the Jeep.

New users are continually being found for the Universal Jeep. Some of them are the result of Willys research. Just as many are the result of Jeep users' ingenuity. A whole line of special purpose Jeeps has been developed for use in airport ground operations. These include crash trucks, baggage vehicles, food carriers, water carriers and lavatory trucks.

Special Duty — A lightweight "Dispatcher" is being promoted for messenger service and similar duties. Ann Arbor, Mich., police department has seven Dispatchers which it uses for parking meter patrol and coin collection.

Mr. Moss says about 25 pct of Willys domestic sales are to firms with fleets of vehicles, with utility companies the largest users.

In addition to its commercial vehicles, Willys is producing a new, lightweight successor to its military Jeep for the Defense Dept.

Dubbed the "Mechanical Mule," it is little more than a platform on wheels. But in many respects it has even greater versatility than the original Jeep. It weighs only 900 lbs, but carries a payload of 1000 lbs. Wheelbase is only 57 in., giving it a turning radius of about 10 ft. A four-cylinder flat, opposed-piston, air-cooled engine turns up 16 hp and a top road speed of 25 mph.

Lots of Nonferrous—It has no axles or spring suspension system and is made primarily of lightweight alloy materials. The flat bed top is magnesium. The frame and transmission casing and housings for the power drop to the wheels are for the most part made from aluminum.

As a companion to the "Mechanical Mule" Willys has spent $2 million developing a larger version with six fold-away seats. It weighs about 1500 lbs and has a payload capacity of the same size.

The engine is aluminum, air cooled, and of a four-cylinder flat opposed-piston design. However, it is of all new design, and is only one of a "family" of engines.

THE BULL OF THE WOODS

I CAN EASY SEE WHY A BIG SUCCESS COULD SIT IN A FLOWERY DELL AN' DREAM HE WAS BACK IN HIS BOYHOOD-- BUT HOW HE CAN SIT AN' DREAM HE'S BACK ON A COLD, CLAMMY, GREASY MACHINE IS TOO MUCH FOR ME!
NO, YOUR BEST DREAMS ARE ABOUT YOUR BEST LOAFING-- I THINK HE DID A LOT OF IT ON THAT MACHINE!
THE OLD BED OF ROSES
T.M. Reg. U.S. Pat. Off.
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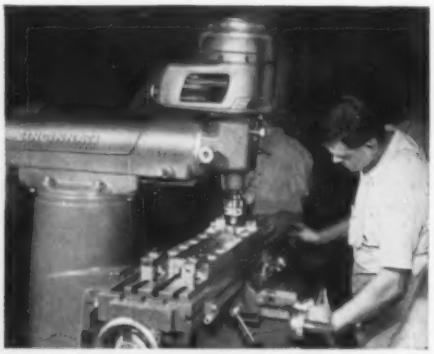
YOU'LL NEVER RUN OUT OF WORK FOR A

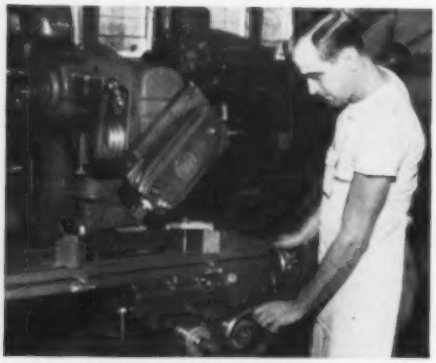
CINCINNATI Toolmaster

Photo courtesy Scottish Tool, Die and Metal Products Co., Cleveland 13, Ohio

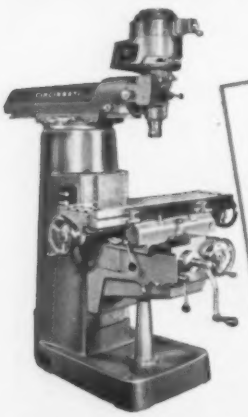
Boring accurate holes is one of the many operations performed at low cost on the No. 1B Toolmaster.



Smooth, accurate manual feed is a big help in milling the inside of box-shaped sections on the Toolmaster. The operator can readily work with two hands on the controls while watching the cutter.



Shaping Attachment adds shaping operations to the variety of milling jobs handled by these machines. The illustration shows how angular surfaces are shaped.



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Four styles available:

1A, ¾ or 1 hp drive, manual feed to quill
1B, ¾ or 1 hp drive, power feed to quill
1C, 2 hp drive, heavy duty head
1D, 1½ hp drive, infinitely variable speeds

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If there's work in the shop, a Toolmaster can do it. More and more tool and die shops are finding that these machines can handle an exceptionally wide variety of light duty vertical and angular milling operations, and drilling, boring and shaping operations as well.

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How Space Agency Will Operate

In a Few Years, Spending Will Reach Billions

Quick creation of NASA is expected by Congress. It's agreed that civilian agency for outer space is needed.

First year's operation will reach the half-billion level. But that's only a start to get it moving.—By G. H. Baker.

▪ This country in a few years will be spending billions of dollars annually to explore outer space and to develop super-advanced rockets and missiles, the experts predict, when a proposed new space agency is established.

First year's operation of the agency—dubbed the National Aeronautics and Space Administration (NASA)—will probably cost close to a half-billion dollars, congressional experts expect.

Quick Approval—The House has already approved legislation creating the new agency. Senate hearings have been held, and quick approval is forecast. President Eisenhower requested Congress to create the agency, but had tentatively programmed only $100 million to get it started.

In final form, the new agency will absorb the present National Advisory Committee for Aeronautics and handle all civilian space and aerial research projects. The House version of the bill would give the new agency blanket authority over civilian space projects and call for a cooperative program with the Defense Dept. on military space projects.

The Senate is expected to set up clearer lines of separation, to reduce friction between the new agency and the military.

Effect on Industry—Some of the space exploration funds now being spent by the military probably will be taken over by the new agency, and added to hefty new expenditures for space projects. Thus, new markets for industries selling to the missile, rocket, and related programs, will develop.

The new agency may signal a new era in industrial access to government research. The House version of the legislation establishing the NASA includes a precedent-making "freedom of information" provision requiring the agency to disclose all data not specifically classified under security regulations.

The new agency may also touch off a new trend in government competition with industry for top scientists, engineers, and technicians. The House measure sets up super pay grades for some 350 top scientists, and authority to hire other lesser employees at salaries higher than normal for the government.

Competitive Pricing Outlook Changes

The Senate has cooled off considerably on a bill (S. 11) restricting the right of manufacturers to price their products competitively. (The bill would outlaw as a legal defense any manufacturer's contention that he adjusted his prices in good faith to meet competition.)

Earlier this year, most senators were favorably disposed toward the proposal.

Social Security May Be Broadened

Hearings Scheduled—Congress is getting ready to fatten up the social security law. The probable outcome is an expansion of benefits paid under the huge social welfare program.

Center of the initial action on suggested changes in the Act is the House Ways and Means Committee. Public hearings on these measures and related matters are to begin June 16. Present plan is to conclude the hearings by June 27.

Probable Approval—Climate for some changes in Federal social security operations apparently is favorable. In election years since 1950, Congress has broadened the welfare program. The increase in the number of persons on benefits rolls to more than 11 million adds to the likelihood that the lawmakers will keep to the same course.

Shortage of time and prospects of committee disagreement weigh against chances of approval of a bill offered by Rep. Forand, D., R.I. This broad-scale measure would add about 10 pct to benefits paid to the retired and the disabled.

Tax Outlook — Also, it would raise to $6000 a year the amount of earnings subject to tax. The ceiling on earnings now taxed for social security purpose is $4200.

Another feature of the Forand bill is its provision for boosting the tax rate.

Legislation that has the best chance of passage this year, though, may call for little more than higher benefits for persons covered now.

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Why Electronics Industry Grows

Widening Markets Keep Manufacturers Busy

Expansion-minded electronics manufacturers are important to Farwest's economy.

Area accounts for almost 25 pct of total equipment sales in the U.S.

Most Coast firms located in California.—By R. R. Kay.

▪ Business is on the upswing for the West Coast's electronics industry. Its leaders say 1958 will be a record year.

And the industry's biggest period of expansion is just beginning.

Consumer Demand Expands—Why so optimistic? The military is taking more and more of the electronics dollar—now 65 pct. And in civilian fields, the trend is to more automation. That goes for manufacturing, transportation, and distribution. Further growth of consumer demand for electronic products will spark the industry in the years ahead.

So, if you're selling goods or services to the electronics makers on the Coast—or thinking about it—keep this in mind: California alone produces and sell 20 pct of U. S. electronic equipment. The other 10 Western states turn out another four pct of the nation's total.

California Jackpot—It's a good and virile market. Last year's sales were $1.775 billion. They'll be higher this year with the added emphasis on missile making. These weapons take a lot of electronic gear.

Marketing memo: You'll find over 558 plants—more than 95 pct of California's electronics industry—in Los Angeles and Orange counties and in the San Francisco-Peninsula-Oakland area. These plants are close to their big customers, the aircraft and missile makers.

Check the table. It shows the size and scope of the industry in the 11 Western states.

Seattle Employment Up

Seattle's aircraft industry is back on its feet. In fact, after a long slump, its recovery is booming along at a rate higher than last year's record.

The Seattle office of the State Employment Security Dept. estimates King County aircraft employment — centering on Boeing Airplane Co.—was 63,000 in mid-May.

The all-time record of 67,800 was set last July, just before the stretchout program started. But this figure includes employment at some subcontractors and a few small independent plants.

The aircraft industry took on 800 new workers last month, the department reports.

North American Layoff

Aircraft payrolls in southern California held steady the past few months. But the full impact of the Pentagon's aircraft stretchout program is being felt.

North American Aviation is going to lay off 3000 workers by the end of August at its Los Angeles division. But Ray Rice, general manager of the division, says the layoff trend will be reversed by late 1959. That's when there will be a production build-up of NAA's F-108 long-range interceptor and its B-70 strategic bomber.

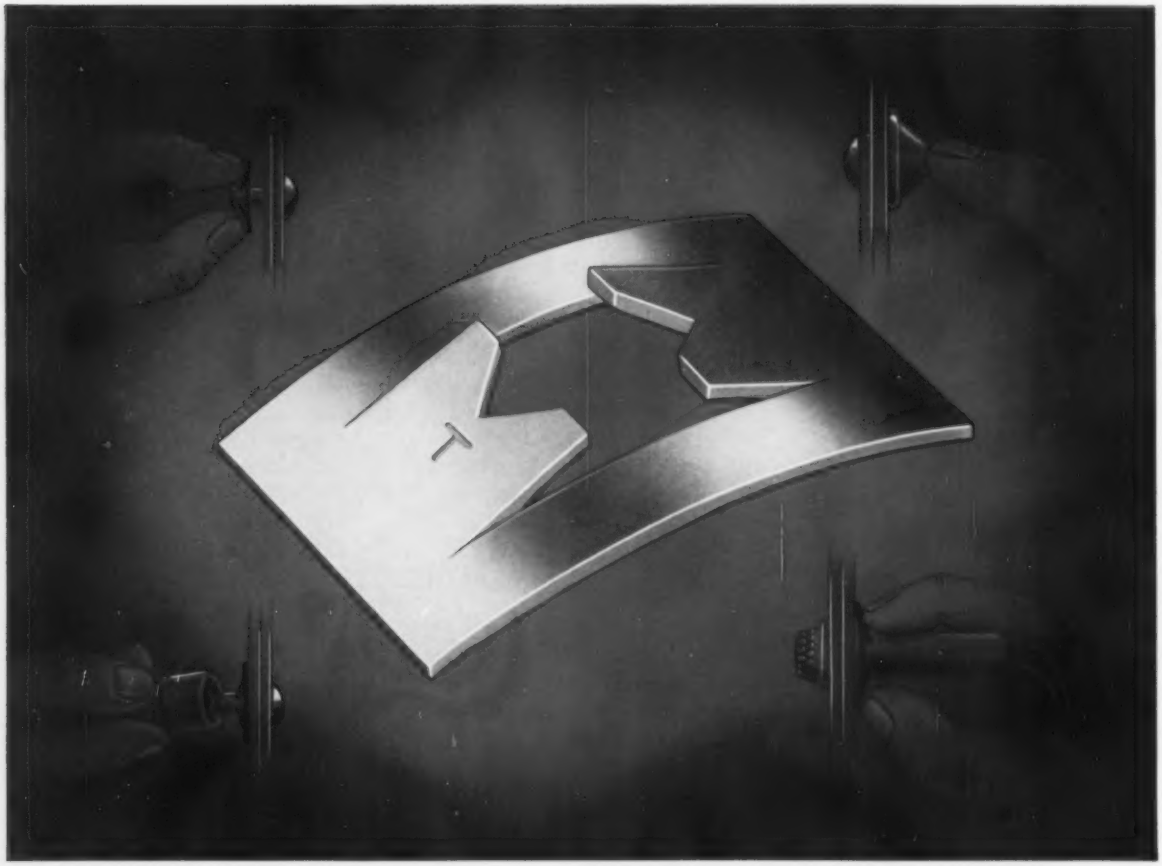
Nose Cone Contract

Solar Aircraft Co., San Diego, has a contract for nose cones and fuselage support sections for the Lacrosse guided missile. Firm now works on eighteen missile jobs.

What Electronics Mean to Farwest

Areas	Firms	Employment	Annual Sales (000)	Pct of Annual Sales in the U. S.
California				
Los Angeles Area	453	82,000	$1,154,000	15.6
San Francisco Area	105	23,000	301,000	4.1
San Diego	25	2,100	37,000	0.5
Other Western	81	16,100	283,000	3.8
Total in 11 Western States	664	123,200	$1,775,000	24.0
TOTAL IN U. S.	3990	680,000	$7,400,000	

Source: 1957 Study by West Coast Electronic Manufacturers Assn.



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Push-On SPEED NUTS lock on everything from thermoplastics to die-cast, chrome-plated steel. Hundreds of variations to fit any shape or size stud —from very small diameters to larger rectangular shapes. Some Push-Ons have "caps" that cover exposed shaft, axle or stud ends.

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Gearmakers Revamp Association

Aim for Stronger, More Efficient Group

Members at American Gear Mfrs. Assn. establish separate product and technical divisions.

New setup is attempt "to do better job on technical as well as trade association activities." —By E. J. Egan, Jr.

▪ Trying out a new set of bylaws designed to make their group stronger and more efficient, members of the American Gear Mfrs. Assn. convened last week at The Homestead, Hot Springs, Va., for their 42nd Annual Meeting.

In general, members seemed to approve the new regulations which (1) split much of the Assn.'s activities down the middle by creating a Gear Products Div. and a Technical Div.; (2) establish vice-presidential posts and appropriate committees for both new divisions; and (3) restrict attendance at certain committee meetings to the actual committee members involved.

Reason for Split—AGMA's outgoing president L. R. Brooks, who is also president of The Tool Steel Gear & Pinion Co., Cincinnati, explained the Assn.'s new organizational setup as an attempt "to do a better job on the technical as well as the trade association side of our work."

Outlining why this would bar some members from sessions they were formerly privileged to attend, he explained that because of their "trade association" nature, some committee meetings within the Gear Products Div. were restricted to "Company" members who "manufacture and sell the product as such."

Similarly, he noted, attendance restrictions within the Technical Div. applied to committees working "on projects that are in formative stages and not ready for general discussion."

Education Plan Detailed—As in previous years, however, the convention program also included several non-restricted sessions.

At the first of these open meetings, Paul J. Leeser, of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., described an in-plant gear education program the firm offers to qualified employees.

Front Office Thinking — Gear makers also learned something about management psychology in an interesting demonstration-lecture given by Edward Walther, a partner in the firm of Management Development Associates, New York. One of the speaker's main points: Experience is not always a good teacher.

In applying past experience to any current situation, Mr. Walther said, the executive must remain completely objective. Similar situations are not identical ones, he maintained, and the subtle differences that do exist may actually prove past experience a false guide for current action.

1958-59 Officers Elected by Gear Association

TAKING OVER: New AGMA officers are (l to r) E. F. Borisch, Milwaukee Gear Co., pres.; J. L. Buehler, Indiana Gear Works, vice pres.; Folke Richardz, Westinghouse, vice pres.; J. F. Murray, Winsmith, Inc., treas.

INDUSTRIAL BRIEFS

The Hot Look—High temperature windshields for supersonic aircraft will be developed by Corning Glass Works under a $2.3 million contract awarded by the Air Material Command, U. S. Air Force. The 3-year development contract calls for fabrication of windshields that will withstand continuous use at temperatures of 850° to 900°F.

Atoms in Alaska—Alco Products, Inc., New York, will furnish the entire nuclear system for the first atomic power plant to be built in Alaska. Designated the APPR-IA, the second Army Package Power Reactor will be erected for the U. S. Army Corps of Engineers at Fort Greely, near Fairbanks.

Record Back in Texas — The world's record for deep drilling, established in Louisiana in 1955, was broken 13 miles east of Fort Stockton, Tex. The Philips Petroleum Co.'s University "EE" Well No. 1 reached the former record, 22,570 feet, and was heading for greater depths. The hole broke the Texas state record, 21,687 feet, on April 28.

"I see what you mean about the sales staff being a friendly bunch!"

Revere Distributor—Revere Copper & Brass Inc. has appointed the Federated Metals Div. of American Smelting & Refining Co. as a national distributor of Revere primary aluminum pig and ingot to the foundry and diecasting industries. The division is a major producer and supplier of aluminum and copper-base casting alloys.

Service Station — Two divisions of H. K. Porter Co., Inc.—Quaker Rubber and Leschen Wire Rope—have opened a joint sales and service branch office in New Kensington, Pa. Located at 450 Second St., it will serve West Virginia, eastern Ohio and western Pennsylvania.

Westinghouse Chair—The Westinghouse Educational Foundation has established professorship in engineering at Alabama Polytechnic Institute. A grant of $75,000 has been made to support the appointment of a Westinghouse professor for an initial period of five years. The Foundation has made a contribution for laboratory apparatus in the amount of $3000 for the department of mechanical engineering.

Northwest Election—Edward Allen, of Star Iron & Steel Co., was named president of the Pacific Northwest Steel Fabricators Assn. The steel group is made up of fabricators in Washington, Oregon and Idaho.

International Affairs — Du Pont Co. will manufacture and sell a new grade of Ultra-high-purity silicon under a process developed by the International Telephone and Telegraph Corp. New process was developed by Standard Telecommunications, Ltd., of London, Eng., an I. T. & T. affiliate.

Operations Shift — Continental Gin Co., Birmingham, Ala., will shift its cotton gin manufacturing activities to its Prattville, Ala., plant July 5. Cast iron foundry operations will be shut down at Prattville but aluminum castings will still be made there. The Birmingham plant will become strictly an industrial machinery plant.

Getting Its Bearings—The Cast Bronze Bearing Institute has held its first annual meeting in Cleveland. The Institute was organized earlier this year as an affiliate of the Non-Ferrous Founders Society. It is preparing a technical manual for engineers on the design of cast bronze sleeve bearings.

Contract at Cuyahoga — Dravo Corp., Pittsburgh, has been awarded a contract by the American Steel and Wire Div. of U. S. Steel Corp. for two Dravo - DeLaval custom-designed coolant systems for a 32-in., 4-high reversing mill at the company's Cuyahoga Works, Cleveland.

Reynolds Sales Moves — The sales headquarters of Reynolds Metals Co. has moved from Louisville, Ky., to Richmond, Va. Unaffected by the move are seven Reynolds aluminum fabricating plants in Louisville.

Millsop Honored—The National Management Assn. has selected Thomas E. Millsop, president of National Steel Corp., as the 1958 recipient of its "Management Man of the Year" award. Mr. Millsop will be honored at the 35th annual conference of the NMA in Los Angeles next October.

Airborne Acquisition — Cutler Hammer Inc., has acquired Airborne Instruments Laboratory Inc., Mineola, N. Y. Stockholders of both corporations have approved the agreement.

Kilns Fired—The Ceramic Div. of Ipsen Industries Inc., is already at its new home in Pecatonica, Ill. The plant is equipped with four batch type kilns. Capacity is expected to increase through the use of shorter firing cycles and quicker cooling.

New Name and Number—Shareholders of Hooker Electrochemical Co., Niagara Falls, N. Y., and Shea Chemical Corp., Boston, have voted to consolidate Shea Chemical with and into Hooker. At the same time, the name Hooker Chemical Corp. will be adopted for the consolidated continuing company.

Helixform*—a new method for bevel gear production!

The new No. 112 Hypoid Helixform Gear Finisher assures improved quality and increased production on spiral bevel and hypoid non-generated ring gears up to 10½" in diameter, and 2½ DP such as employed in passenger car axles.

The Helixform Cutting Method used on this machine offers these advantages:

Conjugate tooth surfaces, minimized gear development, complete control of tooth bearing, and greater adjustability in final assembly.

We will be glad to send a bulletin giving further details on request. Ask for literature on the No. 112 Hypoid Helixform Gear Finisher and the companion No. 112 Hypoid Gear Rougher. Write for it today.

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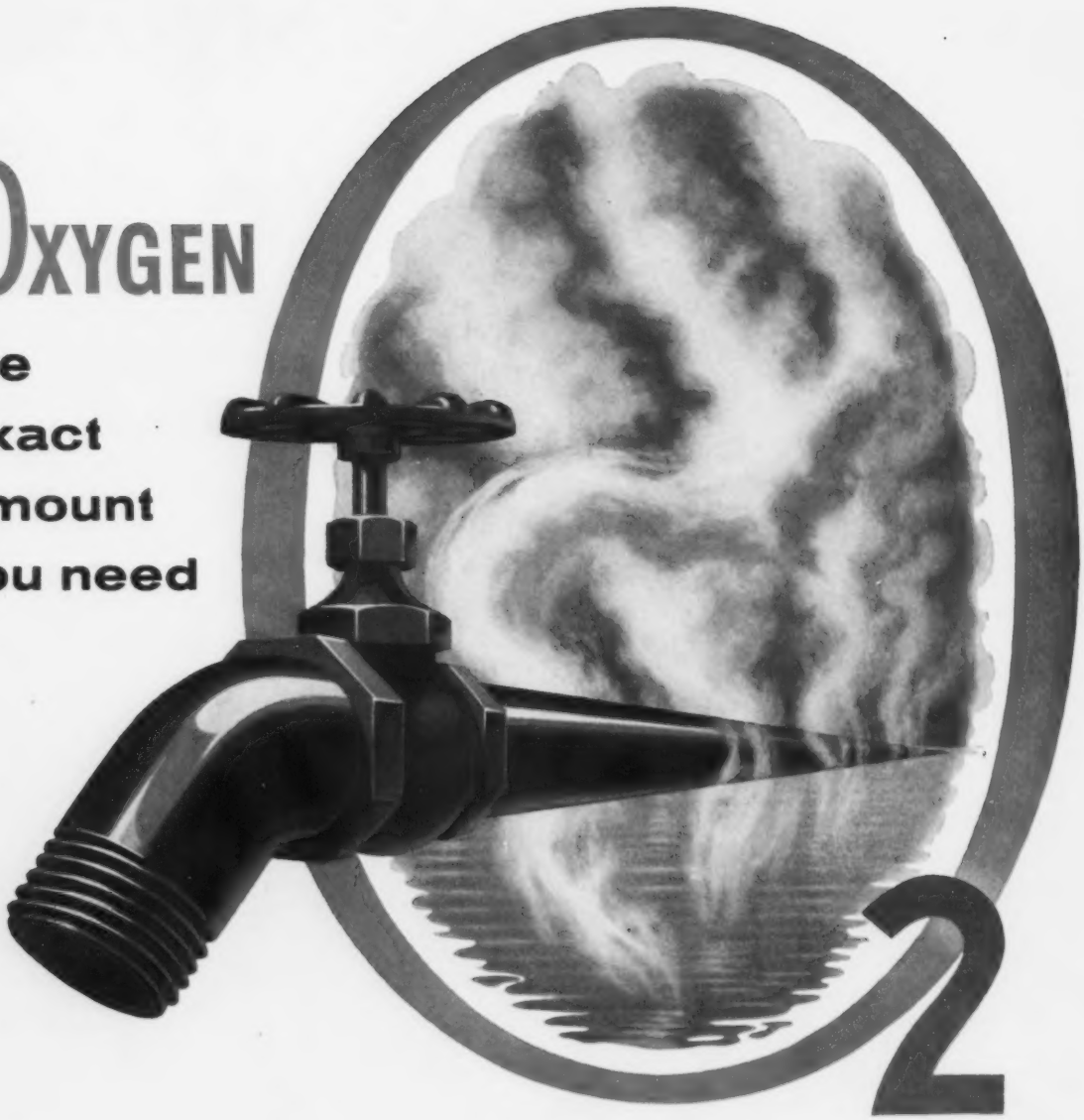

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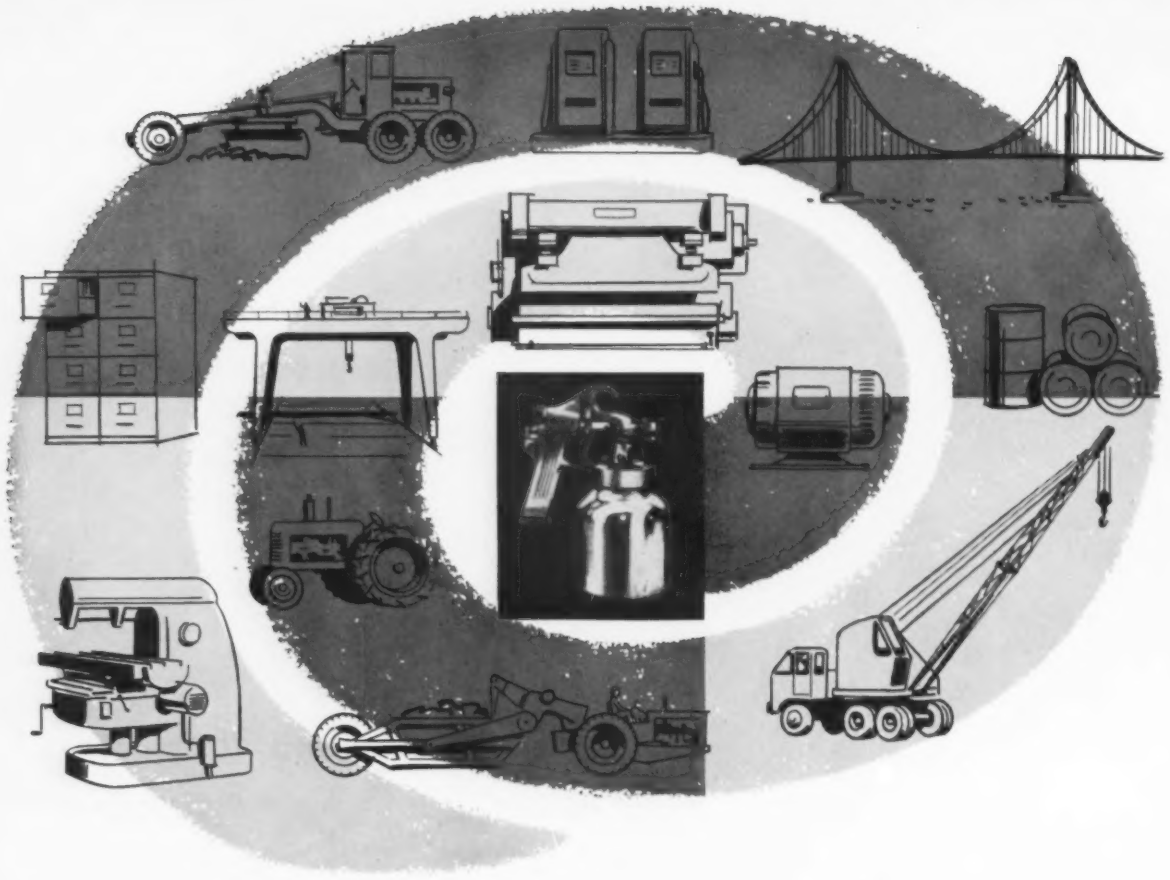

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C. I. Collins, named vice president and assistant to the president, Copperweld Steel Co., Pittsburgh.

J. W. Scallan, elected president, Pullman-Standard Car Mfg. Co., Chicago.

L. L. Ferrall, elected executive vice president and **J. B. Dickerson,** as vice president, operations, Crucible Steel Co. of America.

G. D. Potter, elected president, Corey Steel Co., Chicago; **E. W. Whiteway,** former president, will remain as vice president and consultant; **H. W. Angsten, Jr.,** elected secretary-treasurer.

R. C. Baumgartner, appointed vice president, The Oster Mfg. Co., Wickliffe, O.; **Richard Humiston,** named treasurer and **C. R. Metcalf,** sales manager; **E. A. Oring,** appointed controller.

R. M. Pittenger, promoted to vice president, Ohio Seamless Tube Div., Copperweld Steel Co., Shelby, O.

Robert Dickey III, elected vice president, sales, Union Barge Line Corp., Pittsburgh.

M. H. Campbell, elected executive vice president, and **R. P. Leister,** named secretary-treasurer, Campbell Chain Co., York, Pa.

B. E. Phillips, appointed general sales manager, Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

R. B. Meneilly, appointed manager, tin plate products, U. S. Steel Corp.

J. W. Kennedy, Jr., named vice president, Superior Steel Div., Copperweld Steel Co., Carnegie, Pa.

J. B. Murtland, Jr., promoted to manager, Electro-Mechanisms Dept., Brackenridge Works, Allegheny Ludlum Steel Corp., Pittsburgh.

M. L. Rice, elected vice president, Atlantic Research Corp.

H. E. Eiber, appointed vice president, The Austin Co., Cleveland.

G. R. Goss, appointed general superintendent, hot and cold strip mills, Republic Steel Corp.'s Gadsden, Ala., plant.

B. E. Estes, Jr., promoted to vice president, marketing, U. S. Steel Corp.

J. A. D. Geier, elected vice president and asst. general manager, Cincinnati Lathe & Steel Co.

E. B. Carter, elected president, Wheeling Corrugating Co., Wheeling, W. Va.

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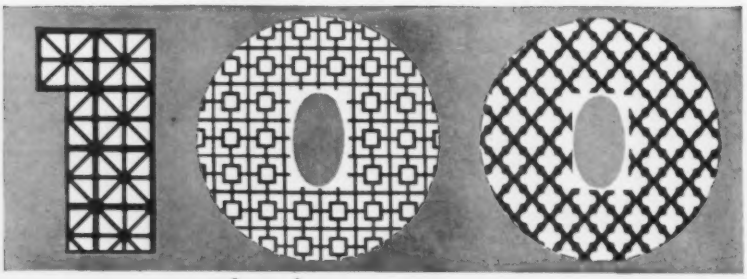
than



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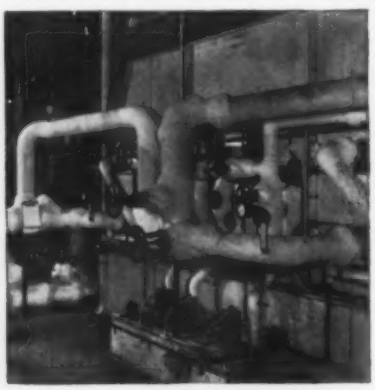

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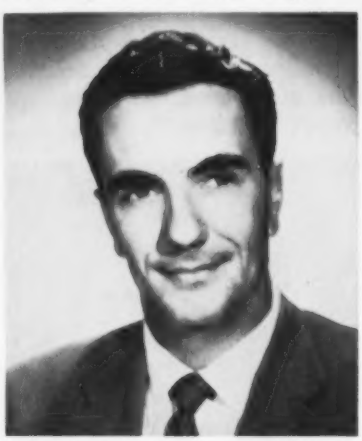
J. P. Dunston, appointed district manager, Atlanta sales district, Kaiser Aluminum & Chemical Sales, Inc.

W. W. Burnham, appointed sales manager, Philadelphia sales territory, Universal Atlas Cement Co., subsidiary of U. S. Steel Corp.



G. A. Morrison, named manager, product design and application engineering, Metallurgical Products Dept., General Electric Co., Detroit.

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pointed supervisor, alloy development and evaluation, Utica Metals Div., Kelsey-Hayes Co.

L. D. Bax, appointed Mountain States district sales director, Benchmaster Mfg. Co., Gardena, Calif.

R. L. Johnson, appointed Southwestern Division merchandise manager, American-Standard, American Blower Div., Detroit.

D. D. Roberts, promoted to sales manager, Valve Div., Eaton Mfg. Co., Battle Creek, Mich.

A. J. Crookes, appointed plant manager, The Colson Corp.'s Jonesboro, Ark., plant.

J. P. Massimiani, appointed midwest district manager, Conveyor Engineering Co., Detroit.

S. D. Flinn, named assistant to president, U. S. Steel Supply Div., U. S. Steel Corp.

J. W. Lourie, named director, foreign sales, Baldwin-Lima-Hamilton's six industrial divisions.

R. F. Dorshimer, appointed chief engineer, Treadwell Engineering Co., Easton, Pa.

H. W. Bennett, appointed assistant superintendent, steel production, Houston mill, Sheffield Steel Corp.

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R. C. Hiltbrand, appointed manager, export sales, The Electric Furnace Co., Salem, O.

OBITUARIES

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W. H. Eisenman, 73, secretary and a founder-member, American Society for Metals.

F. C. Dull, 63, vice president-treasurer, The Monarch Machine Tool Co., Sidney, O.

A. S. Keller, 53, vice president and general manager, Pratt & Whitney Co., W. Hartford, Conn.

F. M. Small, superintendent, industrial relations, Pressed Steel Division plants, Republic Steel Corp., in Cleveland and Elyria, O.

Dr. Meno Lissauer, 78, chairman of the board, Associated Metals & Minerals Corp., New York.

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**Bob Marr,*
P&J Representative
Houston, Texas.
Telephone: MOhawk 7-3964

how changing to a P&J Automatic helped Reed Roller Bit Company.

JOB FACTS:

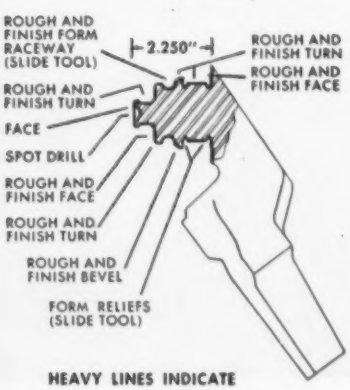
PART: *Lug for Oil Well Bit*

MATERIAL: *AISI 8720 Steel Forging*

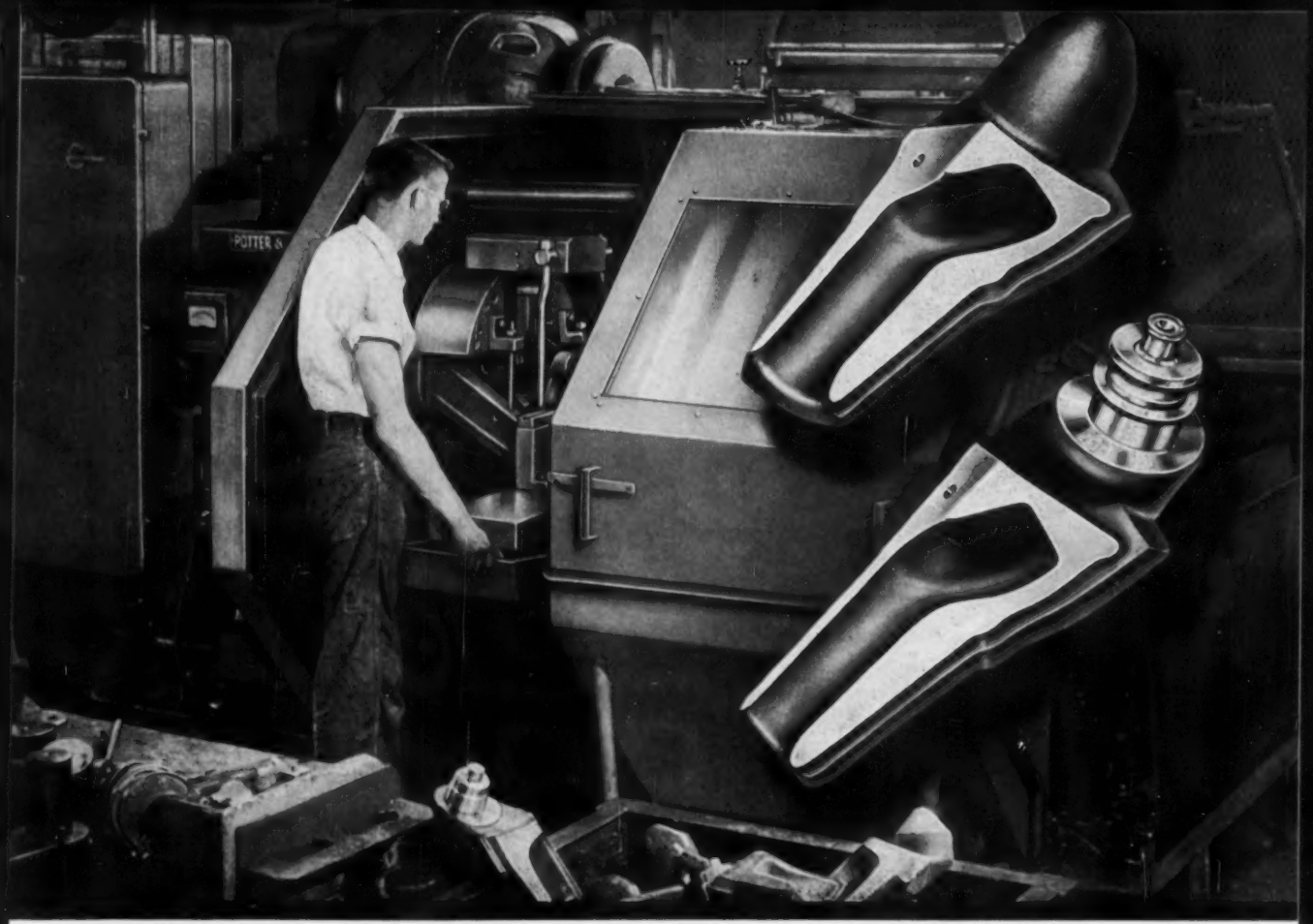
REQUIRED: *Several complex, precision cuts, with certain diameters held to .004" of nominal size.*

THE MACHINE: *A 6DRE-40 Automatic Turret Lathe*

THE RESULTS: *Part completed in single, fully automatic cycle. Machine cycle time just 4.5 minutes!*



HEAVY LINES INDICATE MACHINED SURFACES



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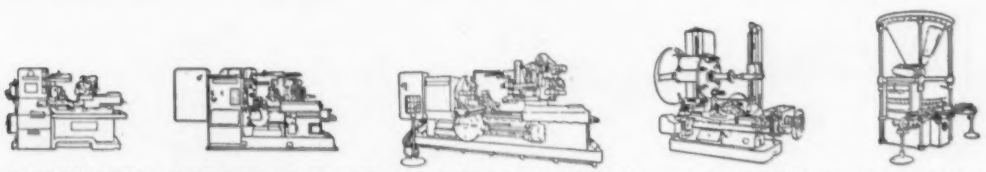
One of our Potter & Johnston 6DRE-40 Automatic Turret Lathes was recently installed in Houston, Texas at the plant of the Reed Roller Bit Company . . . a leading producer of oil well drilling tools. Handling a series of complex cuts on a tough steel forging, this new P&J machine and one operator have replaced 5 semi-automatic machines and released four skilled operators for other important work. Machine cycle time has been cut to 4.5 minutes. These reductions have produced important money savings *plus* a big and badly needed increase in output. And in addition to meeting all these basic requirements, the 6DRE-40 has also proved its toughness. Despite heavy metal removal on an exceptionally tough alloy, this P&J Automatic is operated successfully on a 3-shift basis with time out only for routine cleaning and maintenance.

If – like the Reed Roller Bit Company – you have tough-to-machine jobs you'd like to turn out more economically, a switch from hand or semi-automatic machines to P&J Automatics can do the trick for you too! Act today. Ask the P&J Representative in your area to analyze your requirements and recommend a production plan to meet your specific needs. If you prefer, write direct to Potter & Johnston Company, Pawtucket, Rhode Island.



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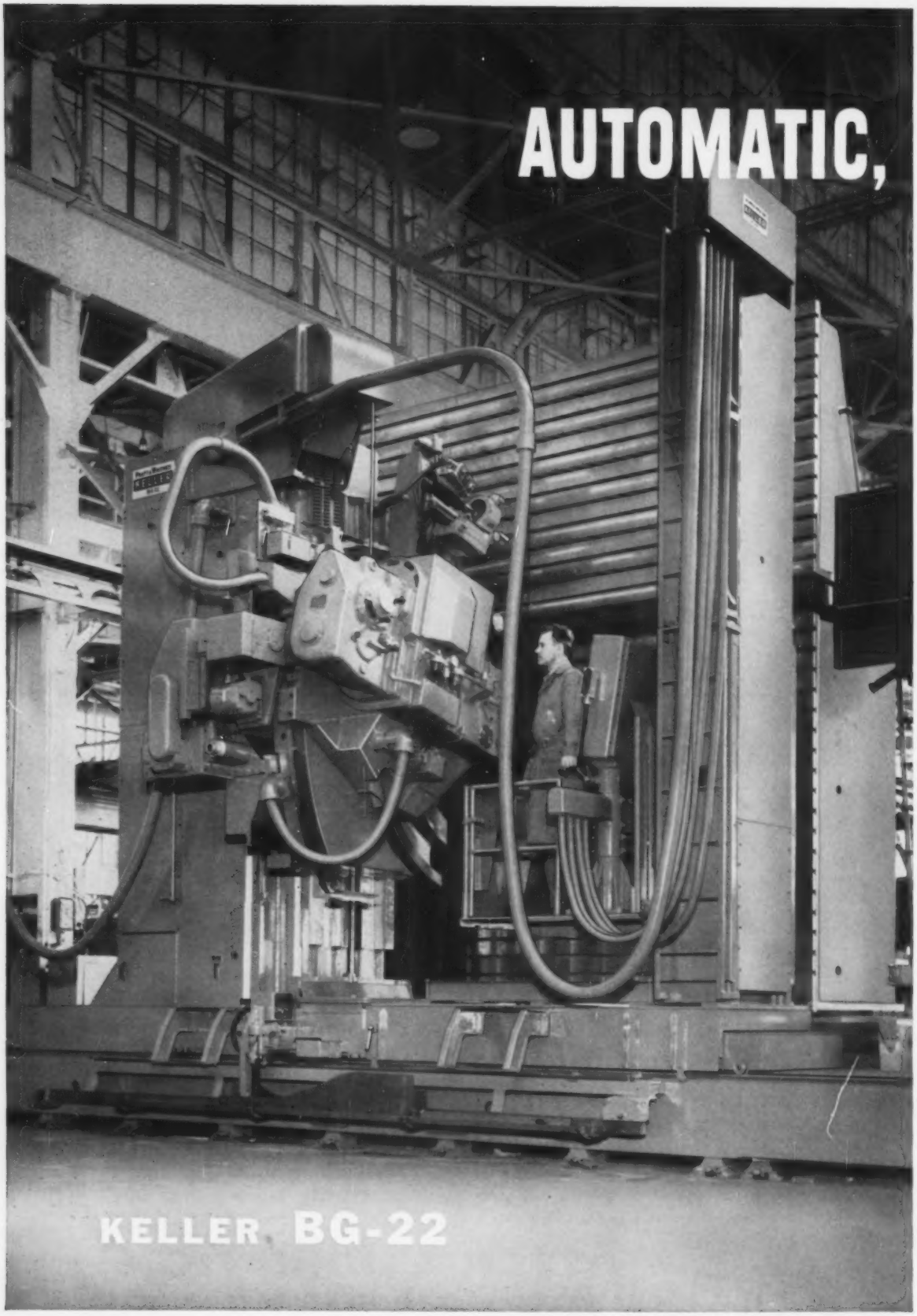
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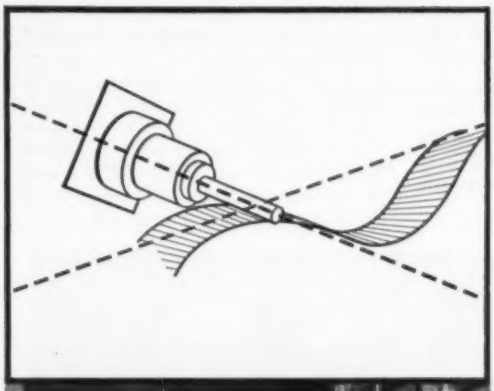

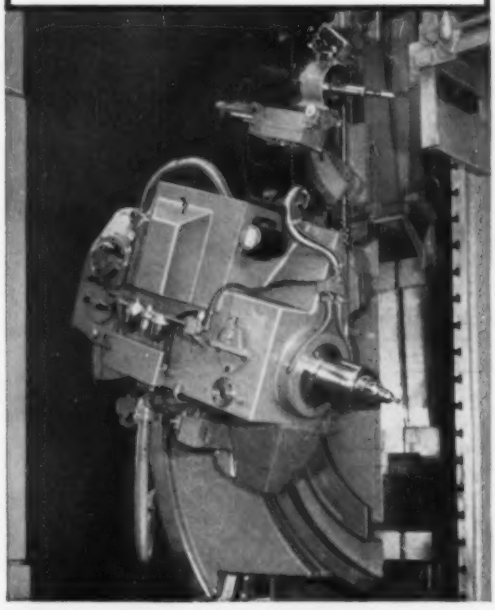

Pratt & Whitney Keller Automatic Tracer-Controlled Milling Machines have long been known throughout industry for their ability to produce complex, irregular 2- and 3-dimensional shapes. They bring outstanding speed, accuracy and economy to the manufacture of dies, molds, prototypes and production parts.

The special machine shown here – a modification of our giant Type BG-22 – adds a "new twist" to the already great versatility of these machines. This special machine can be operated as a standard Keller . . . profile-milling from a 2-dimensional template or duplicating a 3-dimensional full model. In addition, it is equipped with a specially designed milling head that has a range of tilt from 20° above to 20° below the horizontal. With the degree of tilt of the head and cutting tool controlled by a template, this machine will be used to generate "warped surfaces" by profile milling. This type of milling is frequently encountered in the production of aircraft structural components where the outer surfaces of the part must be accurately profiled and, at the same time, correctly twisted or "warped" to conform with the designed contours of the aircraft's surfaces. The development of this special Keller Machine makes it possible to produce these "warped surfaces" by the most direct, accurate and economical method.

Your own operations may not involve the milling of "warped surfaces." But the example of this special machine demonstrates Pratt & Whitney's experience and engineering know-how in solving special production problems. And – whatever your requirements – for fast, low-cost milling of irregular shapes and complicated curves, there's a P&W Keller Machine just right for every work size with capacities ranging from 36" x 20" to 20 feet by 7 feet.

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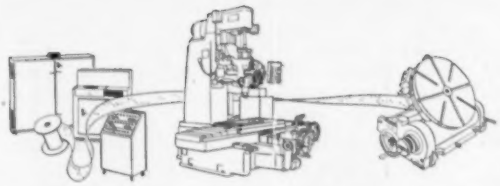

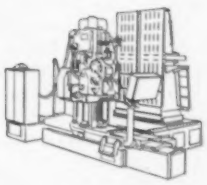

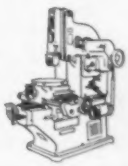

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THE IMPORTANCE OF 'DAG' DISPERSIONS FOR ASSEMBLY AND RUN-IN

The advantages of using 'dag' dispersions for both assembly and run-in lubricant applications are vital to the useful operating life of machinery and engines. Dry lubricating films formed on friction surfaces with colloidal graphite in volatile carriers possess many desirable advantages; lower coefficient of friction, lower bearing temperatures, smoother run-in and reduced maintenance costs. Also, protection is afforded against momentary failure of the oil supply.

United Welding rebuilds more than 5000 diesel engine blocks and cylinder heads a year. After repairing and resurfacing, all bright metal parts must be protected against oxidation, foreign particle abrasion, and lubricated for re-assembly. One material performs all of these functions. 'dag' 154 — colloidal graphite in an isopropanol carrier — is mixed in a ratio of one part 'dag' 154 to nine parts alcohol and applied by spray to each completed unit. This tough, dry lubricating film has eliminated the necessity for a protective grease coating. Foreign particles cannot adhere to the film . . . even after a year in storage, all that is necessary is to blow the dust off the part with an air hose. Since degreasing is no longer required, a substantial savings in materials and labor is realized. During the subsequent run-in operation, the microscopically-thin film of graphite minimizes wear on newly machined surfaces. In addition, because of the much lower surface tension which exists between oil and a graphite surface, oil spreads more rapidly and over a greater area — thus permitting an oil film which has been broken to re-establish itself quickly. Results are longer periods of full film lubrication and, again, less wear. Trade publication reprints are available. Also, write for Bulletin 421 on 'dag' dispersions for assembly and run-in. Address Dept. IA-68.

A rebuilt diesel cylinder head is sprayed with 'dag' 154 as assembly lubricant at United Welding Processes, Inc.

Pre-assembly application of 'dag' 213 prevents piston seizure at Walter Kidde & Co.

Walter Kidde & Company manufactures a four-stage aircraft compressor, the heart of an airplane's pneumatic system. Absolute operational reliability must be guaranteed. Lives depend on it. Therefore, particular care is taken during run-in to insure the compressor's operation against the possibility of piston seizure. By applying 'dag' Dispersion No. 213 — colloidal graphite in an epoxy-resin solution — to the aluminum pistons before assembly, Kidde has solved this problem. The piston coating is applied by spray, then oven cured at 350° F. for 2½ to 3 hours. The result is a film which is hard, durable, and inherently slippery. During run-in the graphite works into the surface to become practically integral with the metal. The application of 'dag' colloidal graphite, together with their ultrasonic cleaning technique which prepares a cleaner surface beforehand, completely eliminates galling and seizure thus cutting rejects during break-in to 2%. Acheson dry film lubricants provide the answer to many such pre-assembly applications; surface protection against oxidation, aiding press-fits of cylinder liners into engine blocks, etc. Bulletin 435 on dry film lubrication and reprint MW, containing further information is available at your request. Or call in your Acheson Service Engineer.

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Tool Up for Stamping Through Use of a Die Bank

By S. J. Maiorana and F. J. Covelli—Production Engineers, Commercial Shearing & Stamping Co., Youngstown

Picture tens of thousands of stock die components, neatly stacked and catalogued, ready for immediate use.

That's the die bank, a source of big savings if you can adapt your stampings to combine some of these existing tools.

▪ Recently, a government agency saved $15,000 by adding ¼ in. to the diameter of a stamping it wanted to buy.

The original inquiry, for end closures on shipping containers, specified 71¾ in. OD. Commercial Shearing & Stamping asked if this exact diameter was essential; it would require dies costing about $15,000—but a die set was already on hand to make the same shape with 72 in. OD. The switch proved feasible, so tooling cost was eliminated.

This isn't a unique situation. Many designers are taking advantage of existing die components to minimize tooling costs on stampings. Most of the stock components are for circular shapes with various dished or flat crowns, with or without vertical and/or horizontal flanges. A few oblong and rectangular shapes are also possible.

A great many designs can be based on such shapes. Parts now being made entirely or primarily with stock die components include lawnmower decks, LP gas tank mechanism covers, display sign bases, ends for concrete mixer

READY TO GO: Part of the die bank at Commercial. All told, it includes almost 50,000 components.

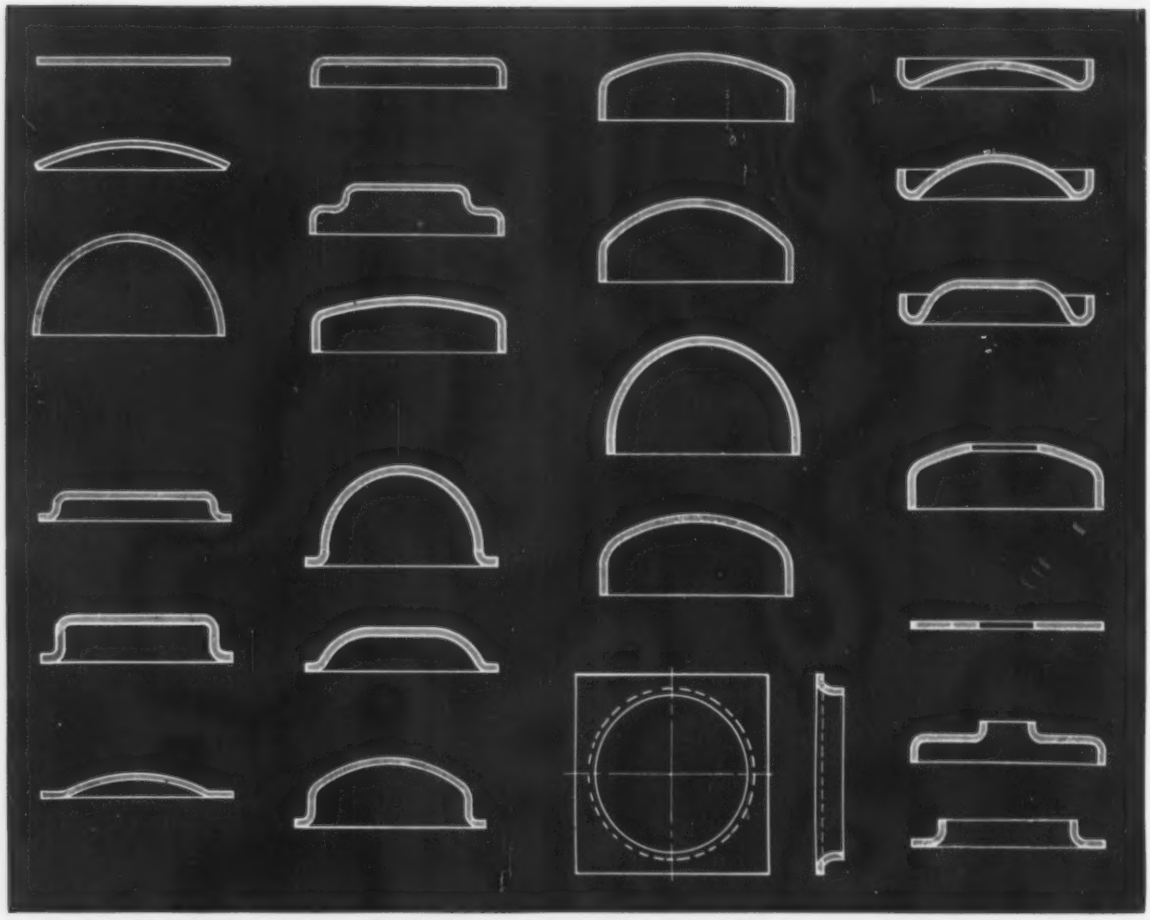


FIG. 1: Many different shapes can be formed from stock components in the die bank. These are only basic types which can be altered by varying combinations of components to change certain dimensions.

drums, pipe fittings, valve diaphragm housings, wheel covers, generator end bells, muffler parts, and water heater jacket tops.

Generally Lower Cost—For most parts which can be primarily produced in one press operation from stock die components, tooling costs will run from zero to 20 pct of the cost of a complete new die set. Substantial tooling cost reductions are also possible even if extra press work is required.

As an indication of the range of choices a designer has: standard components in the "die bank" at Commercial Shearing & Stamping cover a range of diameters from 2½ to 72 in., and metal thicknesses from 20 gage to ¾ in. Twenty-four basic shapes are listed, each available in a large number of sizes. Some basic shapes are shown in Fig. 1. Actually, Commercial's die bank contains close to 50,000 separate components, which can be combined in almost endless variety.

Despite the thousands of different components in stock, the die bank can't cover every conceivable dish radius, flange diameter, other dimension, or every metal thickness for every shape. However, tooling cost savings are by no means limited to parts which can be formed entirely from existing die components. The reason is that the standard die set is assembled from several components, most of which can be used in a range of die sets.

On In-between Sizes — Suppose the work in the die in Fig. 2 is being formed of ¼-in. steel. Components are available in Commercial's die bank to produce this shape, in metal of this thickness, in almost any whole-number diameter from 8 to 72 in.

But what if the designer wants a diameter of 10½ in? Many of the die components which can be used to make this shape in 10 or 11 in. diam can also be used for a 10½ in. diam. There would be no need for a new die shoe, punch pad, punch holder, blank holder adapter, or blank hold-down ring.

And, since the die bank has blanking dies in whole and half-inch sizes, a blank nest for 10½ in. diam would be available. This leaves only the punch ring and die ring to be made especially for the 10½ in. diam part.

The same is usually true if a

metal thickness not covered by components already in stock is specified, or when some other specification such as flange diameter is a size which hasn't been made before.

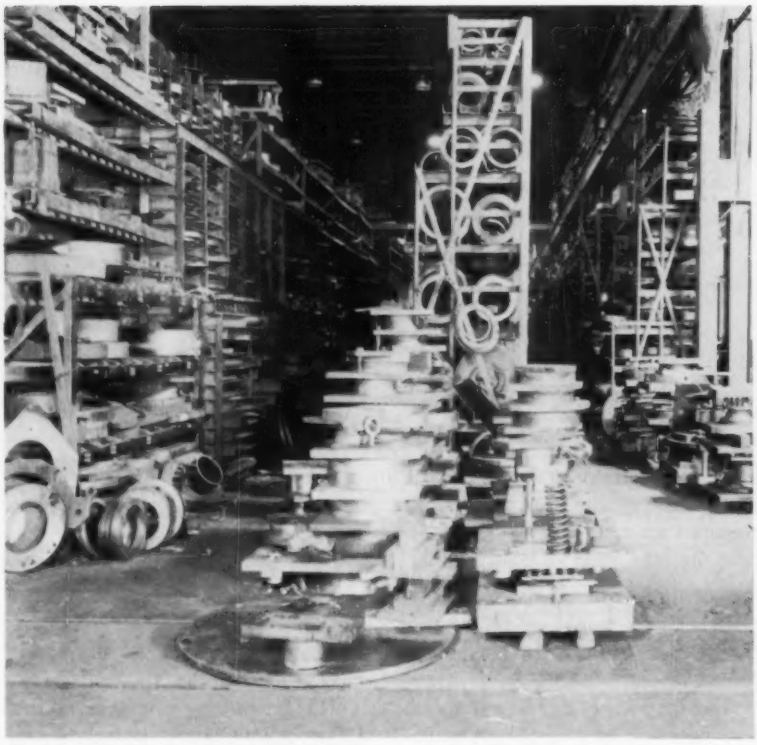
Still Proves Cheaper — Usually, when a piece falls within the general range of the die bank, but includes one or more dimensions not covered by existing components, only a new punch ring and/or die ring, and/or punch pad will be needed. Even if all three have to be made up, total tooling charge likely won't exceed 15 to 20 pct of the cost of a complete new die set.

Effective use of a die bank can often be made even when certain features of the part obviously aren't standard. Examples are the louvers in the generator end bell, Fig. 3, and the notch in the lawnmower stamping, Fig. 4. These required extra operations with specially-made die components. But, since most of their forming utilized existing die components, total tooling cost was still low.

American Coleman Co., manufacturer of an aircraft towing tractor, faced a typical dilemma with its wheel covers. The tractor has four-wheel drive, and both front and rear axles are steerable. Yokes transfer power from the axles to the wheel; covers are needed to keep stones and other debris from this mechanism. Since the wheels turn in relation to the axles, the covers must be dished out to provide clearance for the yokes in any wheel position.

Tried Others First — Stamping was the obvious choice for this cover, since it would give a strong, stiff, thin-walled shell as well as good surface finish without machining. But the quantities for which American Coleman could commit itself were very low. Amortization of substantial tooling charges would bring the per-piece cost up to an unreasonable level.

Short-run stamping methods were considered but rejected, due to cost and also because larger orders for



ENDLESS VARIETY: Commercial's carefully catalogued die bank covers 24,000 sq ft of inside storage, plus many large pieces stored outside. Use of standard parts cuts tooling cost, gets production going sooner.

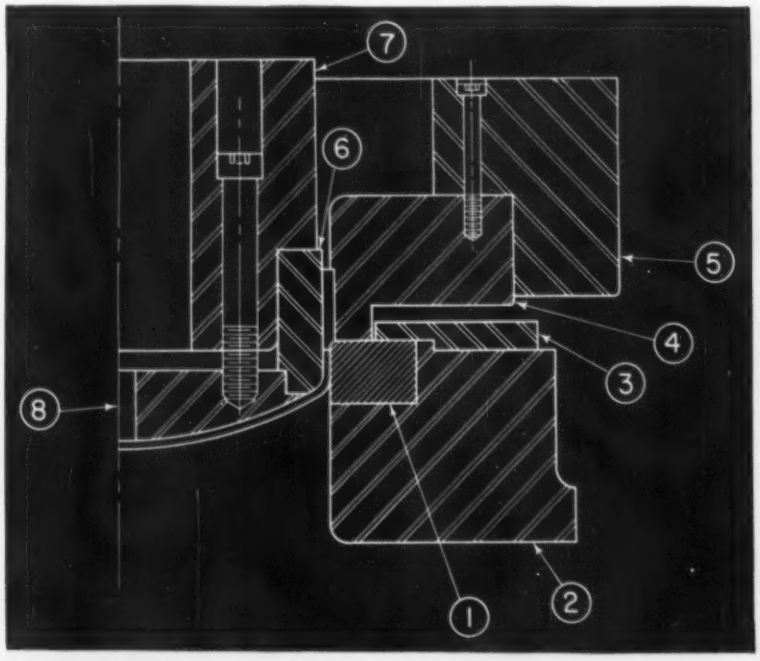


FIG. 2: Typical die set assembled from die bank components includes a die ring (1), die shoe (2), blank nest (3), blank holddown ring (4), blank adapter (5), punch ring (6), punch holder (7), and punch pad (8). Parts that join it to the press aren't shown here.

FIG. 3: Generator end bell is basically a simple shape that's made mostly from die-bank components. Louvers required an extra die charge of $900, but a complete new die set would've cost $2500.

FIG. 4: Rotary lawnmower housing is another standard shape, except for boss, holes and mulcher notch. Extra die parts for these variations ran $2200; an entire new set is estimated at about $7500.

the tractor were expected in the future.

The first wheel cover was therefore designed as a machined malleable iron casting. When tooling amortization was considered the per-piece cost was less than for a stamped cover made with conventional tooling. Each piece cost $8.49, cast and machined, plus its share of the pattern cost of $200.

Partial Answer—This was more than halved by turning to spinning. Unit cost for the spun part was reduced to $3.50, including machining, plus each unit's share of the tooling cost, which in this case was $250.

Then American Coleman discovered that Commercial's die bank had stock dies to make a wheel cover of the required size and suitable shape. The shape selected is a standard dished offset head with vertical and horizontal flanges and dish radius equal to its diameter.

While the shape isn't like either of the previous wheel covers, it provides the necessary yoke clearance and has eye-appeal.

Final Solution—A complete new die set to form the wheel covers was estimated at $2300. The actual tooling charge was only $80, for a trimming die locating pad to produce the specified flange diameter.

There is a small machining charge against the stamped cover. This is for drilling bolt holes. When larger quantities are ordered, it will become economical to have Commercial gang-pierce these holes.

Stamping reduces finished cost of each wheel cover from $8.49 and $3.50 to $1.67; yet, tooling cost is one-third that of casting or spinning.

Well Organized — Access to Commercial's die bank is through a die librarian and records in the Press Shop superintendent's office. The librarian has three sets of records, some of which are duplicated in the engineering department.

One set has a card for each part number; that is, an individual card for every size and shape of stamping ever made by Commercial. Some of these cover special die sets made for specific parts and stored as units, but over 4500 are for parts made from die bank components. Each card lists the components to be assembled into a die to make the part it represents, and tells where in the die bank each component is stored.

A second set of records consists of one card for every major die component in the bank, and tells where it is stored. These cards are filed by type and size of component. When an order is received for a piece which hasn't been made before, and therefore doesn't have a card in the part number file, this set is entered to locate the needed components.

Old Ones Make New Ones — From these records, the die librarian can also determine if any new components will be needed. Often, he will locate a larger, worn component which can be machined down to the required size. Otherwise, he has an inventory of ring blanks and other stock to draw on.

A third set of records consists of die setup cards. Except for jobs which are entirely routine, a card is filed in this section containing all information and instructions required for die setup and production of the part.

At first thought, the die bank idea seems obvious. Its successful application, however, requires die design to utilize standard components, accumulation of large stocks of components, and methods of storage and record-keeping which permit ready access to them.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th St., Philadelphia 39, Pa.

Why Threaded Test Bars Lower A-286 Stress-Rupture Values

By H. T. McHenry and R. K. Pitler—Research Metallurgists, Allegheny Ludlum Steel Corp., Watervliet, N. Y.

If you have any connection with the aircraft industry, you've probably heard of the "problem with A-286." The "problem" arose when bolts and threaded test specimens of A-286 failed to meet rigid stress-rupture specifications.

Here is an authoritative report from the alloy's developer.

▪ A-286 is a corrosion and heat-resistant, austenitic stainless. Ranked as a superalloy, it has very high strength at temperatures up to about 1300°F. Although it has some ambient temperature applications, its hot strength mostly accounts for its many aircraft applications—including high-temperature bolting.

Developed by Allegheny Ludlum Steel Corp., the alloy has chalked up a fine service record in current production jet engines. Recently, a problem arose. Threaded test specimens were failing to meet stress-rupture specifications. In the aircraft industry, particularly, the problem quickly assumed critical proportions.

Tough Tests — In all cases, the bolts were produced to AMS 7478. This requires stress-rupture tests on finished bolts and the ability to meet the minimum rupture life of the A-286 material specification.

Standard smooth bar and notched bar rupture tests previously conducted by bolt producers showed that the wire from which the bolts were made passed their respective requirements. Similar tests conducted on specimens machined from finished bolts also passed requirements.

It was only when threaded sections of bolts were tested that stress-rupture requirements were not met. These facts indicated that the inadequacy of the rupture life of the bolts was caused by the geometry of the test piece. It was not inherent in the metallurgy of the material.

Check Geometry — A possible cause for the lower stress-rupture strength stems from the fact that a spiral notch produces less notch effect than the standard notch used for rupture specimens. A-286 has greater notch strength than unnotched strength. Thus a lesser degree of notch effect could be expected to produce a lower stress-rupture strength.

A second possible cause for premature failure might arise from miscalculation of the cross-sectional area of the thread. While AMS 7478 bases the effective cross-section on the mean of the root and pitch diameters, test results indicate that this value gives a calculated stress level lower than the stress actually placed on the specimen.

Moot Point — It has long been accepted practice for room-temper-

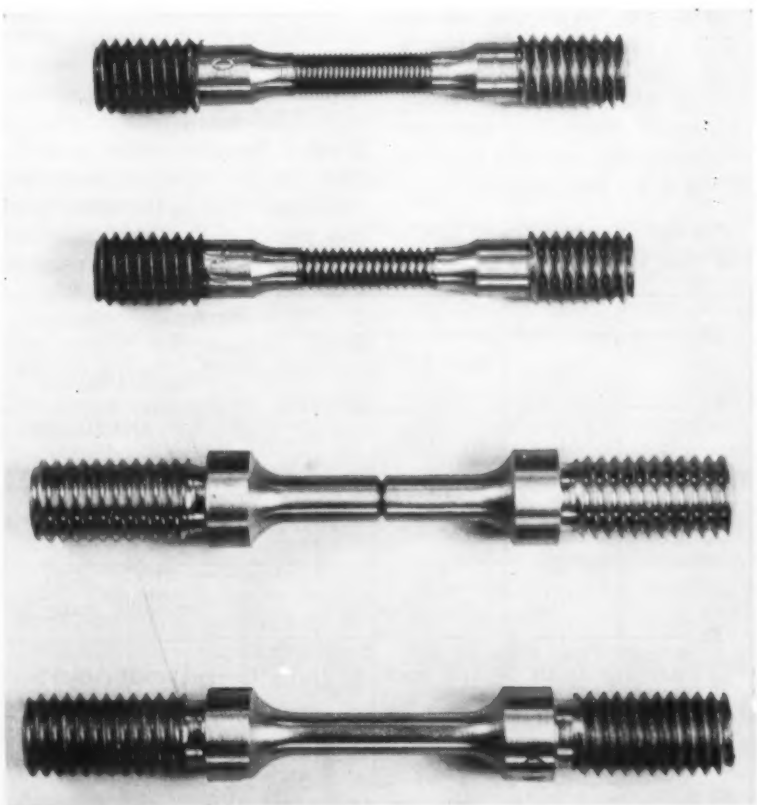


FIG. 1: Four types of test bars were used in testing stress-rupture properties of A-286—fine thread, coarse thread, notched, and smooth.

TABLE I

Room Temperature Specimen	.02 pct Y. S.	.2 pct Y. S.	T. S.
Smooth Bar	75,300	96,500	146,500
Amer. Std. Thread Using Mean Diam	78,600	96,500	146,700
Amer. Std. Thread Using Root Diam.	87,300	114,500	174,000
V-Notched Bar	.....	.....	200,000
1200° F Specimen	.02 pct Y. S.	.2 pct Y. S.	T. S.
Smooth Bar	69,300	89,300	107,000
Amer. Std. Thread Using Mean Diam.	64,600	85,500	105,000
Amer. Std. Thread Using Root Diam.	76,600	101,500	124,500
V-Notched Bar	.....	.....	166,000

Chemical Composition: (Heat No. 6 x 174)

C	Mn	Si	Cr	Ni	Mo	Ti	V	Al
.05	1.44	.69	15.08	25.58	1.02	1.86	.33	.13

ature tensile testing to use the "mean diameter" to calculate the cross-sectional area of a threaded section. This method is accurate for estimating the strength contribution of the threads when stressing a bolt pulled in tension at room temperature. Some doubt exists as to its accuracy for measuring the time-to-rupture of threaded specimens at elevated temperatures.

Tests were run to determine the degree to which threaded specimens acted like standard smooth bar and notched specimens in stress-rupture and tensile tests. Five significant conclusions can be drawn from the results of the test program:

Net Results—1. Ultimate tensile and yield strength values are comparable for threaded and smooth bar specimens for which the stress level is calculated from the mean of the root and pitch diameters.

2. When the same calculation is applied to stress-rupture testing of threaded sections, rupture life is shorter than for either V-notched or smooth bar specimens.

3. If the stress level of a threaded section is calculated using the root diameter to determine the cross-sectional area, the rupture curve lies between the curve for smooth bars and the curve for notched bars.

4. The notch effect resulting from a thread is not as great as that of a standard V-notched specimen. This is true even when the profile of the thread root and the ratio of the minor cross-section to the major cross-section is identical to the standard notch.

5. Fine threads impart less notch effect than coarse threads.

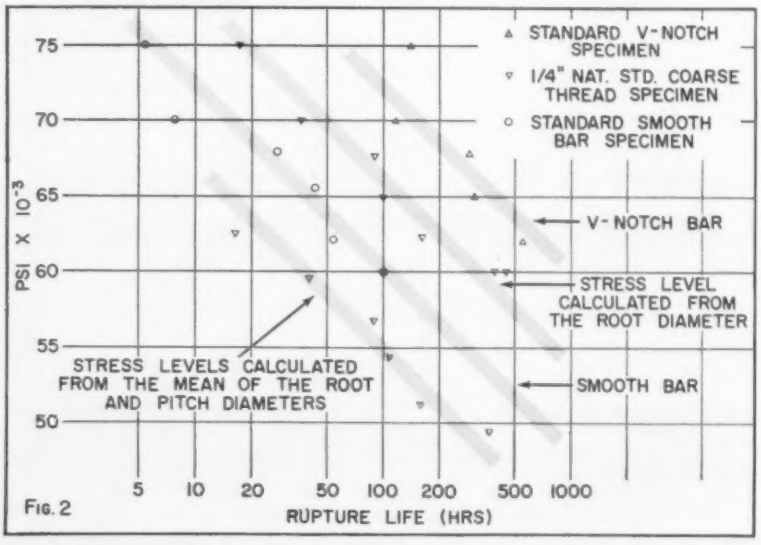


FIG. 2

COARSE THREAD: Stress-rupture curves are compared at 1200°F.

Thread Types—In the test program, stress-rupture curves for smooth bar and 60° V-notch specimens were compared to curves for specimens with threaded test sections. Both coarse and extra-fine, ¼-in. diam. threads were used to determine the effect of thread coarseness on notch sensitivity.

All rupture tests were performed at 1200°F. In addition to stress-rupture tests, tensile tests were made with similar specimens at room temperature and 1200°F. These tests were intended to determine whether the variations in test results were a function of temperature and/or strain rate.

Typical Heat — Test specimens were taken from a single bar of consumable-electrode vacuum melted A-286. The chemical analysis of this heat is shown at the bottom of Table 1.

In all respects, the properties of this heat are typical of A-286. Test specimens were solution-treated at 1800°F for one hour and oil quenched. Then they were aged at 1325°F for 16 hours and air-cooled prior to machining.

The four types of specimens used are shown in Fig. 1. Stress-rupture tests were conducted with all four types. Tensile tests were made with all but the ¼-in. American Standard Extra Fine threaded specimens.

Notched Bars — Smooth bar specimens had a test section diameter of 0.250 in. and a reduced section of 1 in. Notched bar specimens had a notch root diameter of 0.195 in. and a reduced section diameter of 0.275 in. The notch angle was 60° with a vertex radius of 0.005 in. (±0.001 in.). The ratio of the minor cross-section to the major cross-section was 0.5.

The specimens with ¼-in. American Standard Coarse threaded test sections had a root diameter of 0.181 in. The threads were ma-

chined so that the roots were rounded similar to the shape obtained with a roll-threading operation. The radius at the root vertex was 0.005 in. (±0.001 in.).

This radius at the root and the 60° angle of the threaded groove presented a notch similar to that of the standard notched specimen. The ratio of the minor cross-sectional area (based on the root diameter) to the major cross-section (0.250 in.) equals 0.525 and closely resembles that for the standard notched specimens. Length of the threaded section was approximately 0.8 in.

Change Ratio — The specimens with extra-fine threaded test sections had test sections identical to the coarse-threaded specimens except that the root diameter was 0.209 in. for the smaller thread. This changed the ratio of the cross-sectional areas from 0.525 to 0.700.

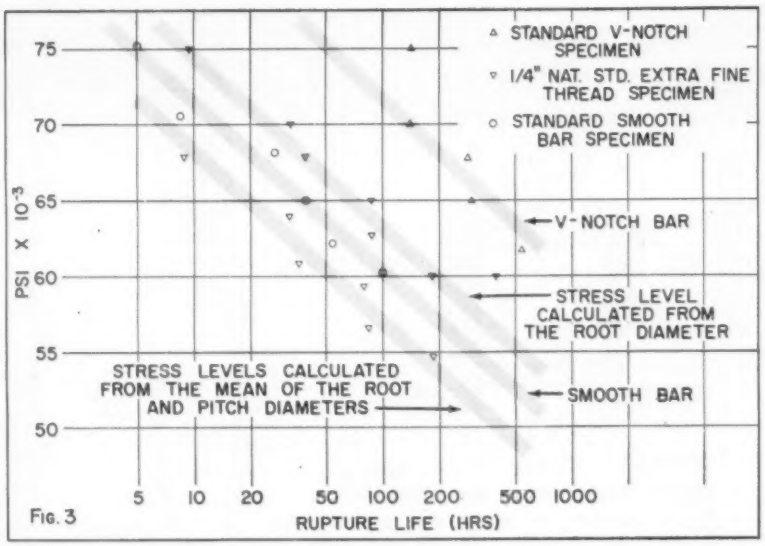
Cross-sectional areas of the threads were calculated from measurements taken on each specimen. In these calculations, both the root diameter and mean diameter methods were used.

Notched specimens were prepared by machining the reduced section and grinding the notch. Threaded and smooth bar specimens were machined only. Variation in machining practice was held to a minimum by taking light, uniform cuts and using uniform feeds and cutting rates for all specimens.

Test Methods — Tensile tests were conducted using a head speed of 0.025 ipm to yield stress and continuing at 0.05 ipm to fracture. A scale range of 12,000 lb was used with a magnification ratio of 500:1. Strain was measured with a 1.0 in. high-temperature extensometer.

Stress-rupture tests were conducted using a lever arm with 10:1 ratio. Temperature control was maintained to ±3°F within a 1 in. gage length. All specimens were held at temperature for one hour prior to loading.

Room temperature and 1200°F tensile results are shown in Table 1. Stress-rupture results are shown in Figs 2 and 3.



FINE THREAD: Comparison curves lie nearer curve for smooth bars.

Which Calculation?—When area calculations were based on the mean diameter, tensile tests at both room temperature and 1200°F showed close correlation between smooth bar and threaded specimens. Yield and ultimate strengths were in equal agreement. Based on the root diameter, tensile values were higher than smooth bar values. Notched bar strength was well above that for all other specimens.

The stress-rupture curves for the same types of specimens (Fig. 2) show that the strength of the threaded specimens is below that of smooth specimens when the mean diameter is used. AMS 7478 requires that threaded specimens meet both smooth bar (23 hours at 1200°F—62,500 psi) and notched bar (23 hours at 1200°F—65,000 psi) requirements.

For example, a specimen stressed at 65,000 psi as calculated by the mean diameter is expected to have a life of 330 hours. Its actual life is 12 hours.

Coarse vs Fine—Stress levels for the coarse threads calculated from the root diameter give a rupture curve that is about halfway between the smooth and notched bar curves. If a fine thread is substituted for a coarse thread, curves for both methods of calculation lie nearer the curve for smooth bar specimens (Fig. 3).

Failed stress-rupture specimens showed that fracture often started in more than one thread at the same time. One specimen failed through the thread root on one side—two revolutions away from where failure occurred on the opposite side.

The outermost part of the crack face was oxidized. This means that the propagation of the cracks on both sides was slow. In contrast, tensile test failures were rapid and confined to one revolution of thread.

For future testing of threaded sections, standard specimens should be used to evaluate material. Threaded sections should be tested to determine allowable stresses for design purposes and to determine reasonable requirements for finished bolts consistent with material requirements.

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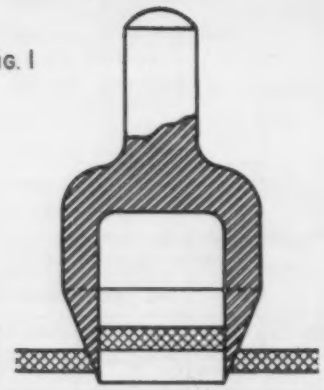
Fig. 1



SIMPLEST METHOD: A punch, shaped to produce the desired blank contour, is placed on the material to be cut and rapped with a mallet.

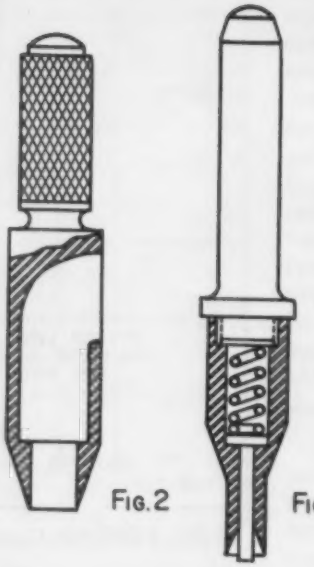


Fig. 2

Fig. 3

FOR COMPARISON: A rod pushed through the side opening (Fig. 2) will eject material. Spring ejector in Fig. 3 punch is automatic.

Dinking Dies Cut Blanking Costs On Thin Sheet

By Federico Strasser—
Consultant, Santiago, Chile

You wouldn't use a sledge hammer to drive a carpet tack.

Then, do you always need expensive, heavy press tools to blank or pierce thin sheet?

Maybe a simple, low cost dinking die could be your key to some important savings.

▪ Because they're easy and inexpensive to make, dinking dies are often preferred over conventional press tools for blanking or piercing thin sheets (max. 0.08 in. thick) of soft metals. Metalworking plants may also find them useful for blanking or piercing laminated plastics, gasket materials, wood, and hard or soft rubber.

A dinking tool is much like a cookie cutter. Made from hardened steel, it's a hollow knife—a closed cutting shape with a sharp, beveled edge.

In using the simplest type of tool (Fig. 1), the material to be cut is first placed on a smooth surface, such as a block of seasoned rock maple with the end grain facing up. The tool is then placed on the sheet of material and struck sharply with a mallet.

For blanking, the bevel is always on the outer side of the knife edge; for piercing, it must be on the inside. This keeps the principal cut edges straight up and down. Cutters for hard rubber are exceptions to this rule in that both cutting edges are beveled equally.

Bevel Angle Varies—The bevel angle depends on the material that's being cut. It's usually 20°, but paper, leather, cork, and similar materials can be cut best with 16° to 18° angles. The smallest angle is used for the thickest pieces. A dinking tool for hard rubber will use an angle of from 8° to 12°, and the material must be heated before it is cut.

When a piece of sheet is blanked with a simple hand punch of the type sketched in Fig. 2, the cut-out section remains inside the tool and must be pushed out manually. The advanced design of a hole-piercing punch shown in Fig. 3 avoids this problem. It has a spring-actuated, automatic ejector.

Dinking tools may also be set up in presses. For such use, they may be made either with or without shanks. Those without shanks are called "open" or "free" tools, Fig. 4. They operate in a special press where the ram moves a solid plate which is parallel to the press table.

Compound Tools Useful—Such tools may also be made in compound form to produce washers and similar items. This is done by joining two or more dinking dies, as in Fig. 5. However, it is not easy to equip such tools with knockout devices, and the material which remains inside must be removed periodically by hand.

High production dinking uses tools with conventional shanks that fit a matching hole in the press ram. Fig. 6 is an example of one such tool which has a spring-actuated ejector. Another means of ejection can be had by tacking soft rubber or a similar elastomeric material along the cutting edges, Fig. 7.

However, high production may be also achieved with dinking dies of the inverted type, Fig. 8. The chief advantage of this construction is that ejectors are unnecessary; the cut blanks pass through the die and the bolster opening.

Strippers Not Common—Strippers are rarely needed to separate either hand- or press-operated dinking tools from the surrounding material. In blanking, especially, the stripping action is aided by the beveled outer edge of the tool. If strippers are needed, they can be actuated either by compression springs, or by rubber blocks tacked along the cutting edges on the opposite side of the ejectors.

Dinking tools are usually made from a good grade of tool steel, carefully hardened and tempered. Case hardened low carbon steel may be used for light duty.

Simple cutting shapes are often machined from solid stock. But for many short run jobs, tools may be built as steel-rule dies. Such tools use thin, formed strips of tool steel which are set into grooves sawed in a masonite or hardwood base.

It's best to leave the proposed cutting edge dull while dinking tools are being formed and hardened. This is to avoid decarburization during heat t r e a t m e n t . After hardening, the edges should be sharpened properly.

Fig. 4

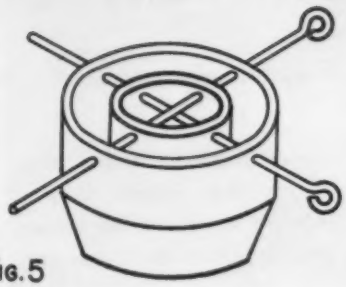


Fig. 5

SHANKLESS PRESS TOOLS: Single punch (Fig. 4) is used to blank a solid piece. Compound dinking tool (Fig. 5) blanks and pierces.

Fig. 6

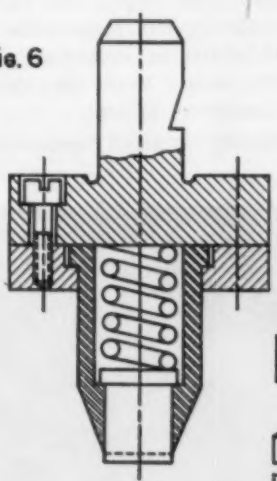


Fig. 8

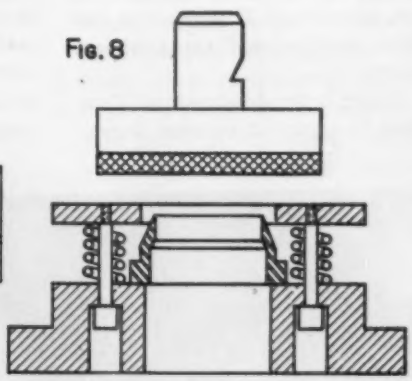
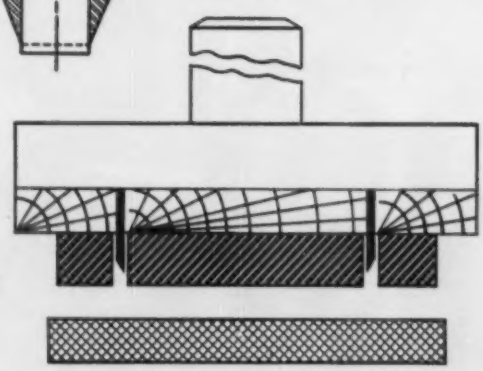


Fig. 7



FOR HIGH PRODUCTION: On fast presses, shank-type dinking tools may use either springs (Fig. 6) or rubber strips (Fig. 7) to eject material. Inverted type of tool (Fig. 8) needs no ejector.

Unit Checks Scratch Depth

By Wallace Umphrey—Boeing Airplane Co., Seattle

Inspection standards are hardly worth the paper they're written on if there's no means of getting close measurement.

And yet standards cannot be relaxed just to accommodate shortcomings of human element.

Here is a new instrument that eliminates the guesswork in scratch measurement.

▪ How deep is a scratch? If deep enough, it can cause failure of a part under load. If shallow, it can cause needless and expensive rejection.

Where is the dividing line? Time spent in argument between inspectors and shop people shows up in red on the balance sheet.

The structures engineer can come up with a theoretical answer. But this still leaves the shop man or inspector without means of getting an accurate measure of scratch depth.

Tool for the Job—With an eye toward filling this need, Boeing Airplane Co., Seattle, has developed an instrument for measuring scratch depths ranging from 0.030 to 0.00005 in. Depth can be read directly in ten thousandths and interpolated to even finer increments. And it works on either flat or contoured surfaces.

Boeing material specifications, for example, state that the scratch on the outside surface of tubing shall be less than 10 pct of the wall thickness. Thus a scratch over 0.003 in. deep in a 0.030-gage tube is cause for rejection.

The new instrument can pass or reject such a tube with ease. Formerly, none of the "standard" methods could measure within these close limits.

Human Element—One of these, the fingernail test, involves passing a fingernail along a scratch. Aside from the personal variables involved, it fails to take into account build-up of material along the sides of a scratch.

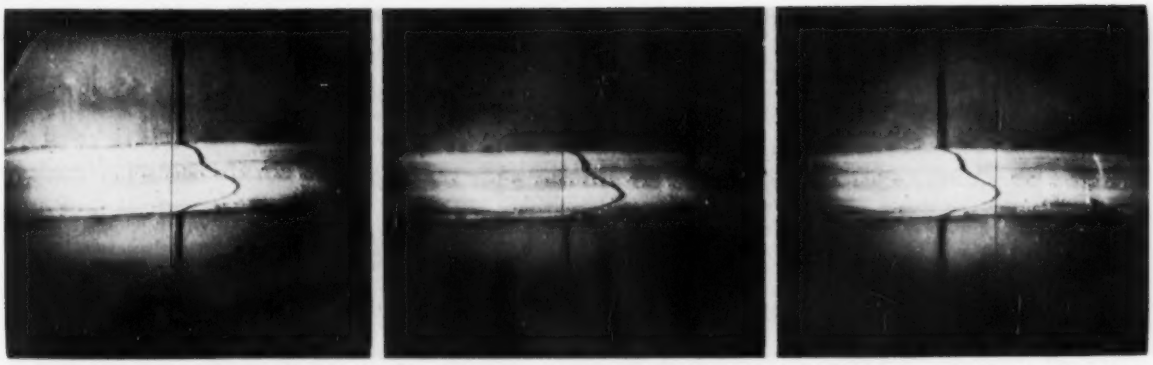
Another method is to make a plaster mold of the scratch. But this is both expensive and difficult. Edges of a plaster mold tend to crumble, giving inaccurate results. The inadequacies of these two methods result in mistakes that are costly as well as dangerous.

The Boeing instrument determines the depth of a scratch by measuring the length of a shadow cast by a beam of light at a predetermined angle across a scratch. When viewed through the eyepiece, the shadow appears as a single fine line dipping to a U-shaped hook where it crosses the scratch. It's the same method astronomers use in measuring the depth of craters on the moon.

Sound Basis — The basis for measurement is a constant 10:1 ratio of length of U-shaped hook to scratch depth. It's maintained by projecting the plane of the shadow at an angle of 5° 42′ 39″ to the surface.

Operation is simple. The viewing microscope, fitted with a single-line reticule, can be moved in a horizontal plane by means of a micrometer spindle.

PORTABLE SERVICE: With battery case in pocket, inspector takes reading of scratch on aircraft skin. Unit requires little training.



THROUGH THE EYEPIECE: After reticule and shadow are brought into focus (left), they are made to coincide (center). Reticule is matched with inside point of hook (right) to show reading of scratch depth.

With the micrometer set at zero, the slot at the bottom of the microscope which casts the shadow is placed on the scratch. The projected shadow line is brought into line with the reticule by an adjustment screw.

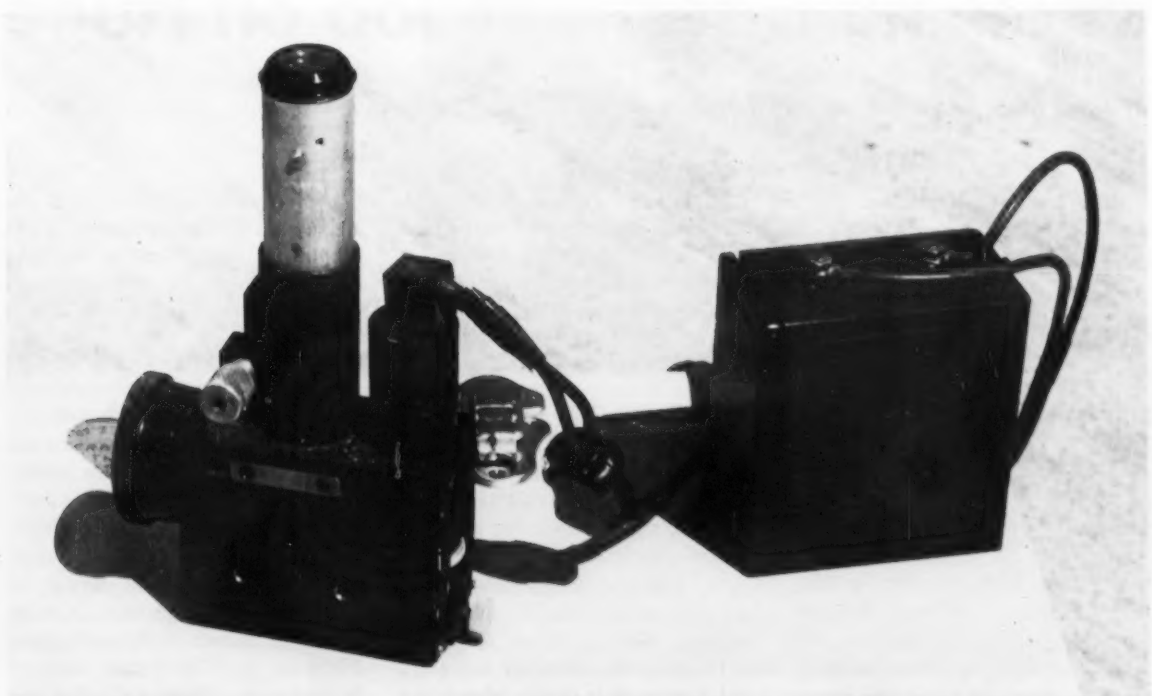
Direct Reading—By turning the micrometer spindle, the reticule is lined up with the bottom of the U-shaped hook. The micrometer reading then shows the depth of scratch within 0.0001 in.

Highly polished surfaces sometimes cause difficulty in distinguishing the shadow line. A thin layer of water-soluble titanium white casein paint applied to the scratch area will bring out the shadow.

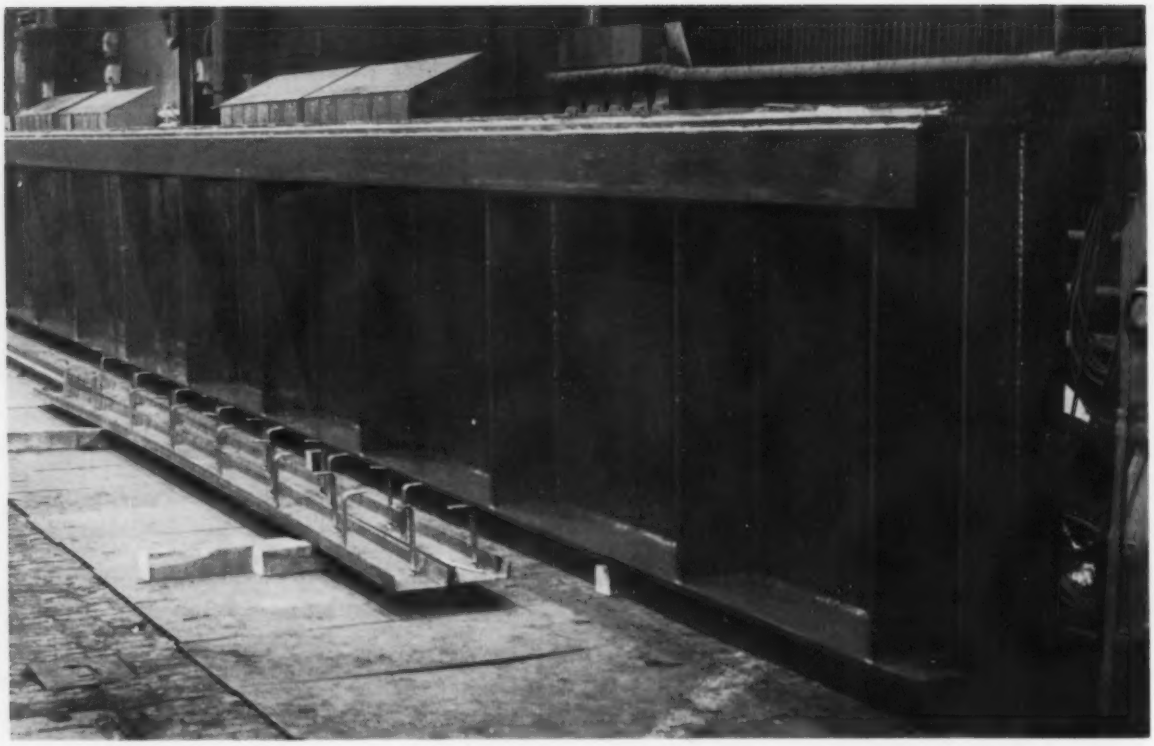
The instrument is portable, being 1½ in. wide by 4 in. long. The eyepiece is about 7 in. above the base. Exclusive of the battery case, it weighs 2 lb 4 oz.

Pocket-Sized Power — The dry cell battery, in a case which can be carried in a coat pocket, powers the projector light bulb. The instrument, ruggedly designed, requires little maintenance.

Although developed to measure scratch depth, it can be used to determine the flushness of rivet heads where aerodynamic smoothness is a factor. It can also serve as a precision tool for the surface examination of many different materials: bonded panels, metals of all kinds, plastic parts, and glass.



DESIGN FOR PRECISION: Micrometer handwheel (left) indicates scratch depth reading within 0.0001 in.



ALL-WELDED UNIT: Crane girder is made up of web and flange plates in three sections spliced by welding.

Welding Does Fast Job on Huge

By James Angus—General Foreman, Welding Shop, Weirton Steel Co., Weirton, W. Va.

Just because a project calls for one-of-a-kind or limited production, it doesn't mean that efficient assembly methods can't be used.

In fact, it pays to set up for production joining.

Automatic arc welding, coupled with versatile mounting, can do the job on bulky parts.

▪ In fabricating massive girders and beams, assembly time depends heavily on speed and efficiency of joining. That's why arc welding plays a strong part in one firm's list of building methods.

At Weirton Steel Co., Weirton, W. Va., the maintenance shop keeps up with the latest developments in automatic and semiautomatic arc welding techniques. In one recent project, the entire girder was assembled by arc welding.

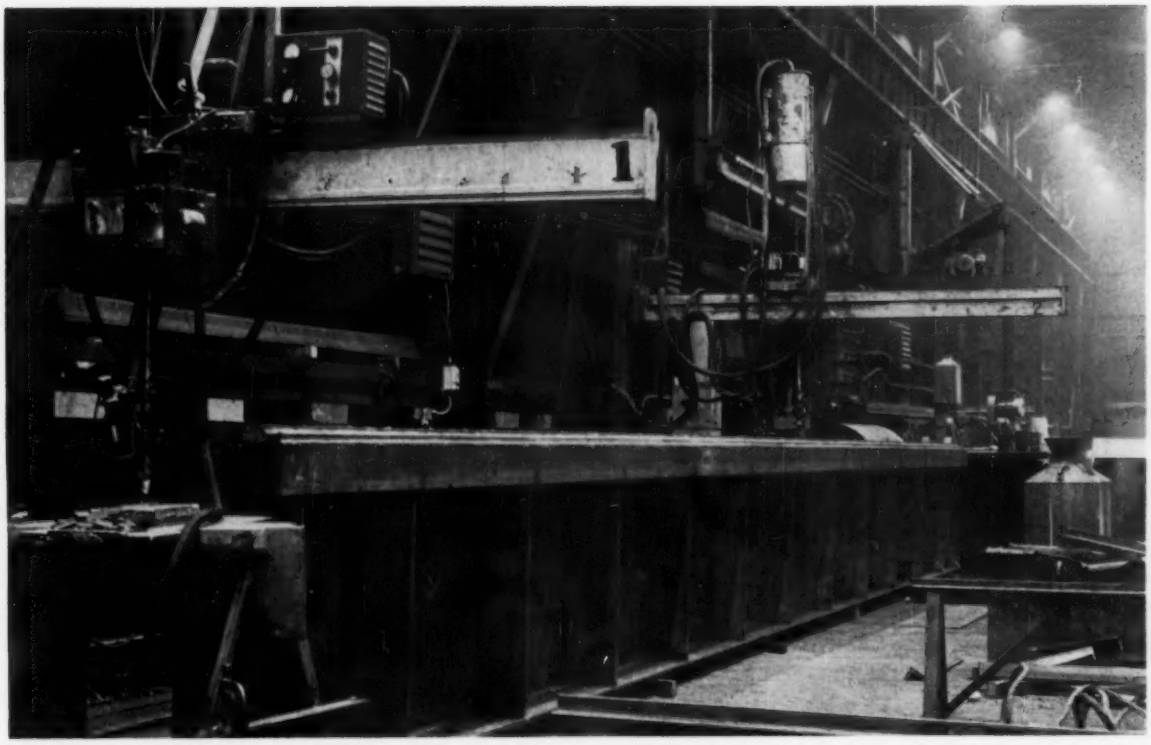
All-Welded Unit—Destined for a 100-ton crane, the all-welded girder is 58 ft 9 in. long, 5 ft deep with 24-in. flanges. A total of 47 plate and angle sections are required for the complete assembly.

The web and flange plates which are in three sections are spliced by welding. The top flange plates are of 1¼-in. stock, while the web plate and two bottom flange plates are 1 in. thick.

Angle rails are welded to the undersides of the top flange. Thirteen 1-in. plates act as stiffeners on each side of the web with angle bracing members at the ends.

Adapt Welding Heads — Two Lincoln Electric submerged-arc welding heads were adapted for the longitudinal seams between the flanges and the web. The sinker pass was made at 24 ipm, 600 amp, 30 v, with the second pass at 12 ipm, 700 amp, 36 v.

The welding heads travel on boom rails fitted to vertical posts riding on a track at the rear of the beam setup. The booms have 14 ft of height adjustment. For the lower flange-to-web joint, the elon-



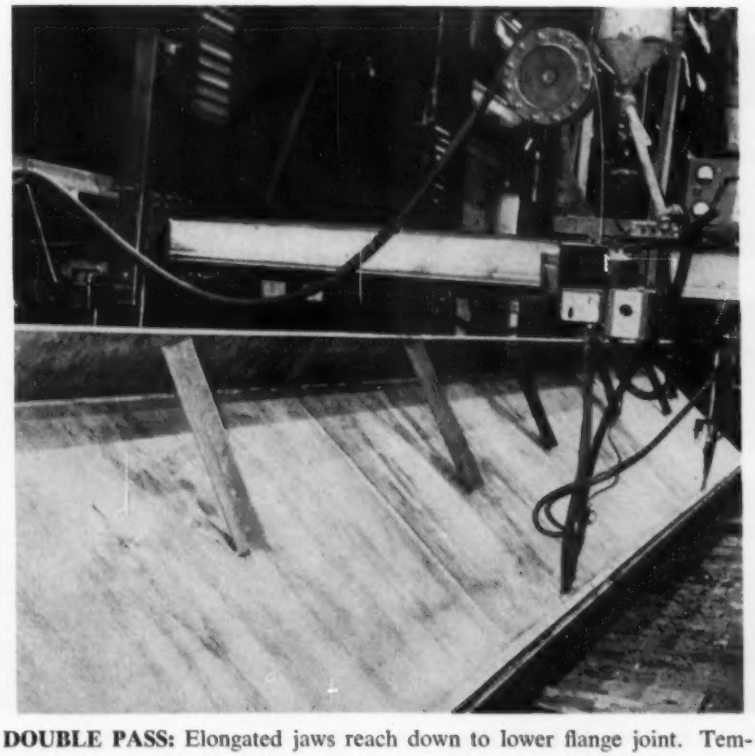
SPEED FILLETING: Twin welding heads make two passes to join each flange plate with 5/16-in. fillet welds.

Girders

gated jaws on the heads reach down with the beam positioned at a 45° angle.

Speed Cuts Distortion—On a section of such size, there's danger of distortion from shrinkage stresses in using slower-speed conventional welding methods. Originally, hold-down bolts anchored the girder flange to the floor during welding. But the speed of the submerged-arc welding now makes this unnecessary.

A Lincoln Spreadarc mechanism on each welding head oscillates the electrode points at right angles to the line of travel. This permits a wider bead, as well as fast buildup on worn surfaces.



DOUBLE PASS: Elongated jaws reach down to lower flange joint. Temporary braces are tack welded until stiffener plates are welded in place.

High-Speed Diecasting Line Features Automatic Pouring

By Herbert Chase—Consultant, Forest Hills, N. Y.

Parts are diecast mainly because it's fast—and saves on subsequent work. It follows, then, that related operations should be geared to the same kind of efficiency.

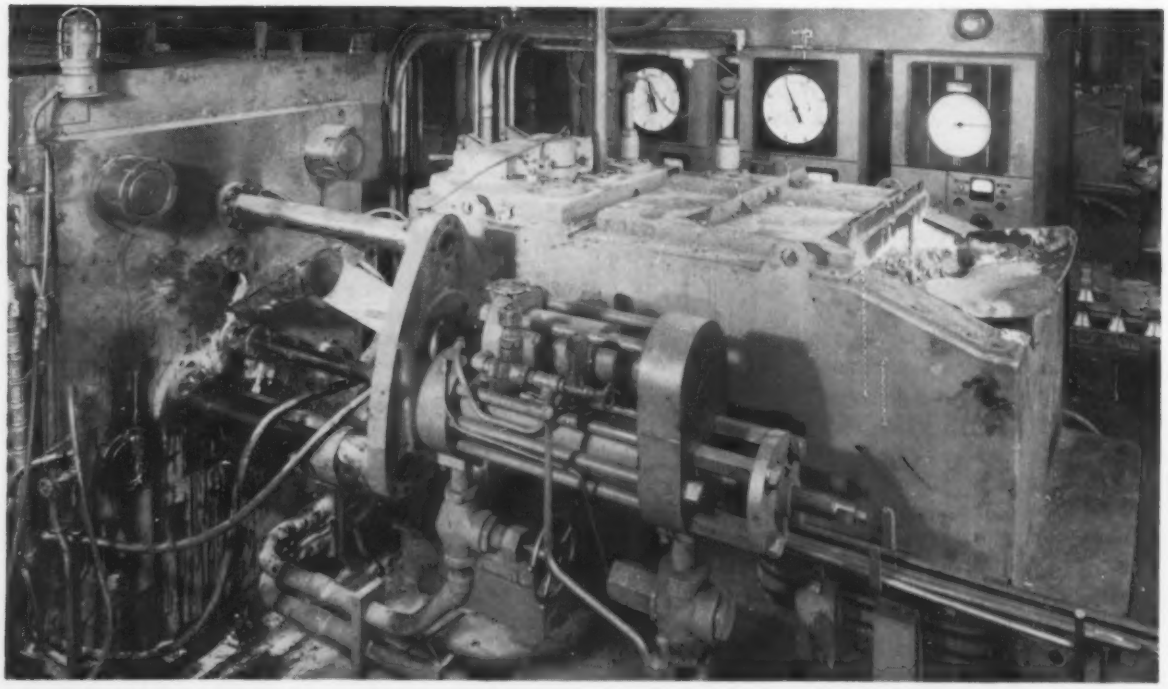
Heating and pouring are two big areas where time can be trimmed. Better castings and fewer rejects also result.

▪ Increased demand for turbo-type torque converter transmission has led to a growing need for aluminum diecastings, many of which are quite large. Chevrolet Div., GM, has two relatively new plants for making such parts; it also buys some of its needs from outside sources.

Many advanced diecasting practices are employed by Chevrolet. The Turboglide plant at Toledo, for example, has automatic pouring of molten aluminum in measured quantities from a holding furnace at each diecasting machine. This is done with Ajaxomatic furnaces, which apply low air pressure momentarily to the molten metal in one of the dual holding compartments. Time under pressure is short and in proportion to the weight or volume of metal to be fed into the cold chamber of the diecasting machine.

Actual melting is done in three gas-fired furnaces. Two are Stroman cylindrical tilting reverbatory units of 1500-lb capacity, each melting 600 lb an hour. The third is a Selas furnace capable of melting 3500 lb an hour; it has a sloping hearth above which are the gas-fired radiant burners. All three melting furnaces have refractory walls and are tapped into similarly lined ladles by which molten metal is transferred along Cleveland tramrails to the holding furnaces.

Two Remelt Scrap—Both aluminum ingots and scrap, the latter returned by conveyor from the trimming areas, are melted in the Stroman furnaces. Charges run about 60 pct scrap delivered from hoppers, and 40 pct ingots, fed by hand. For



HOLDS AND FEEDS: Ajaxomatic holding furnace automatically sends a precise amount of molten metal down a chute to the diecasting unit. Furnace instruments and controls are on the panel in the background.

the Selas furnace, however, a hand-loaded conveyor automatically feeds ingots only. This furnace supplies metal chiefly to the holding furnaces at the two largest casting machines. They make the biggest and heaviest castings—housings that weigh 17 to 17½ lb.

The Ajaxomatic holding furnaces are only 50-kw capacity; each holds 1800 lb of molten alloy in two separately heated compartments, one having a holding hearth and one a pouring hearth.

Molten metal from the trolley ladle enters the holding hearth compartment, then flows through an orifice well below metal level to the pouring hearth section. It stays at about the same level in both. Backward flow through the orifice while pressure is applied to metal in the pouring compartment doesn't change the net delivery set for the particular casting.

Gives Cleaner Metal — Heat is supplied by a low frequency inductor under close (±5°F) automatic pyrometer control. The inductor keeps the metal circulating so that any dross it may contain rises to the surface. Dross is skimmed from the charging compartment once a day. As the entrance to the electrically heated pouring spout is always well below metal level, dross doesn't enter the spout and contaminate castings.

Thus, the use of induction heated, automatic ladling furnaces helps promote good castings, free of dross, as well as savings in time, labor and heat.

Air pressure for automatic ladling is provided by four blowers. They discharge into pipes that run the length of the two lines of diecasting machines. There's one outlet to each holding furnace in the line, supplying air at 2 psi above the metal in the pouring hearth. Air is applied only for the short time necessary to eject the correct amount of metal for the casting shot. Control of discharge time is by an electronic timer.

Pouring Time Varies — Pressure for pouring is constant, but pouring time is varied automatically to compensate for changes in metal level in the furnace. Metal level, which changes with each shot, is indicated on a control panel dial. By observing the level indicating instrument, the trolley-ladle operator knows when refilling is needed.

Automatic pouring, besides being fast, permits close control of quantity and minimum loss of heat. This makes for good castings and minimizes rejects. Since heat is applied internally, there's no localized overheating, oxide formation or temperature stratification.

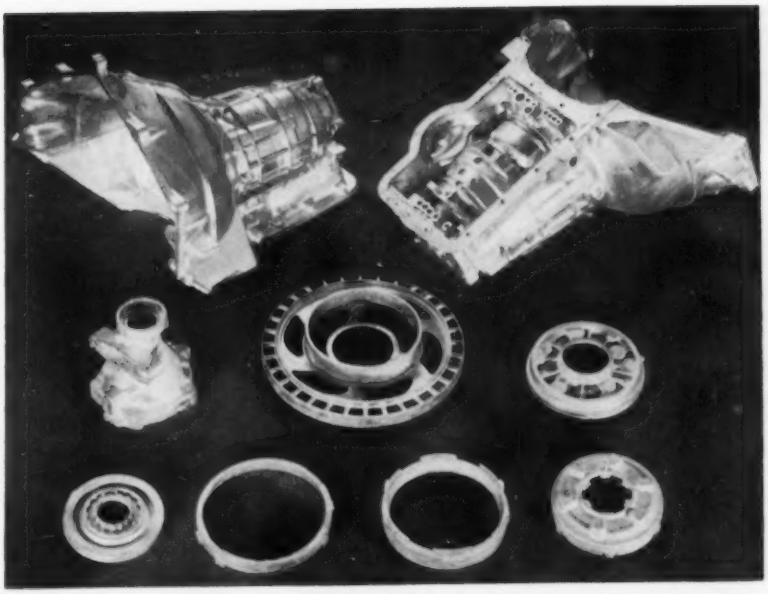
Metal is heated only to the optimum casting temperature of 1200°F, and the gentle induction stirring action makes for temperature and alloy homogeneity. Moreover, the refractory lining is a good insulator; besides conserving heat, it affords comfortable working connections in adjacent areas.

Pushbutton Start — Each casting machine cycle is largely automatic but is started manually by closing the machine door and pressing a button. This causes the die to be closed and locked, and starts the pouring timer. Then an air valve opens and the pressure makes metal flow from the furnace spout down a short trough into the cold chamber of the machine. As soon as this timer runs out, the injection ram is released and applies full machine pressure to the metal.

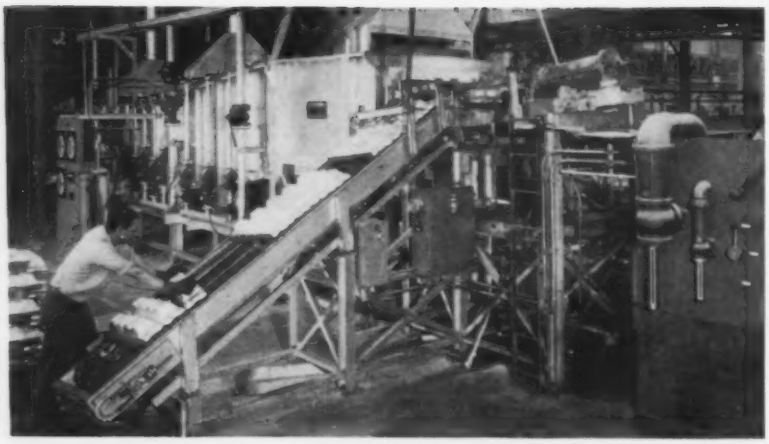
After a short dwell for the castings to solidify, cores are withdrawn hydraulically, the ram moves back automatically and the die opens. The "biscuit" of metal filling the die injection hole is pushed out and ejector pins advance to push the casting free. It is removed by hand and, for the smaller machines, is placed on a table to cool. This completes the cycle, except for spray lubricating the die and occasional application of lubricant to the ram.

The plant has 14 casting machines. Two are 1200-ton Cast-Masters and nine are 600-ton units of the same make. The three others are 750-ton B & T machines. Nine different castings are produced; all but the 17-lb transmission case are cast in dies having either two or four cavities.

King-Size Casting—Transmission cases are among the largest alu-



FINISHED WORK: Eight of the nine diecast aluminum parts made at Chevrolet's Turboglide plant in Toledo. Transmission case, one of largest aluminum diecastings being produced today, weighs 17 lb.



SMOOTH FLOW: Ingots are hand-loaded onto conveyor for automatic feeding to the Selas melting furnace.

CLOSE QUARTERS: Waste motion is eliminated by locating trim presses right next to the casting machines. Parts are trimmed four at a time and scrap returns by under-floor conveyor to furnace hoppers.

minum diecastings being produced commercially today. The dies weigh 17½ tons each and are parted through the long axis of the casting. Large hydraulically actuated cores are pulled horizontally from each end of the casting, moving along the axis of the piece.

One core slide also is pulled vertically. At a point 16 in. below the center line of the casting is the center of a 3-in. hole through which metal is forced by the shot piston to fill the die. Hydraulically operated toggles lock the die.

All machines are actuated by a 1200-psi line of the plant's central hydraulic system, supplemented by accumulator bottles and an intensifier at the machines. An 8-in. hydraulic cylinder advances the 3-in. injection ram 36 in. to fill the dies of the largest machines.

Normally, these two machines can run through their cycle in about 45 seconds; this doesn't include casting removal or lubrication of the dies. Output of about 40 transmission cases an hour from each of the large machines can be attained.

Trimming — The large castings are placed on the floor to cool, then transferred by conveyor or truck to a machine shop in an adjacent building for trimming. Smaller castings are trimmed in presses near the casting machine.

Flash, runners and biscuits, along with any rejected castings, are pushed onto an incline back of the press and slide onto an under-floor conveyor, one of which serves each line of machines. Scrap that the conveyors carry away is elevated and dumped into hoppers adjacent to the melting furnaces.

Hydraulic Midwest trim presses are used. They have multiple-cavity dies that trim in one stroke as many castings as there are on the gate. Castings are pushed through the die and elevated into tote boxes for delivery to the heat-treating furnace, or go directly to the machine shop.

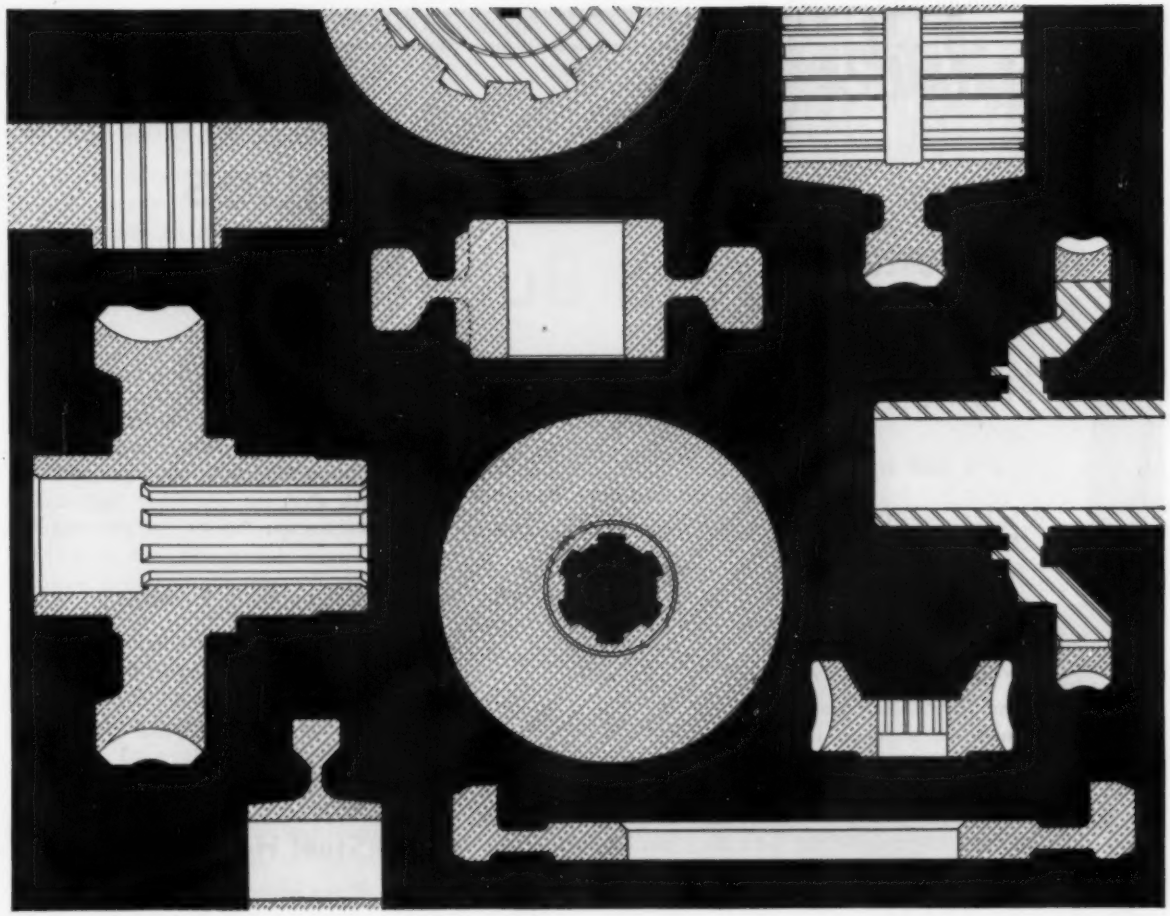
All casting machines have sheet steel enclosures around the dies. Rolling doors opposite the die opening must be fully closed by the operator before the machine will run through its automatic cycle.

Each casting machine operator gives his full time to the machine and to removal of castings; another man operates the matching trim press.

Stress Relieve Turbines — After trimming, turbine castings are transferred to a vertical Industrial Heating Equipment Co. furnace for stress relief at 450°F in a 3½-hr cycle.

All castings are made from Alcoa No. 380, equivalent to GM-4199M aluminum alloy. Its major alloying ingredients are 3 to 4 pct Cu and 7.5 to 9.5 pct Si. Iron is held below 1.0 pct. Other maximum impurities are 0.10 pct Mg, 0.50 pct Mn, 0.90 pct Zn, 0.50 pct Ni and 0.30 pct Sn.

Practices not detailed here are generally the same as in other plants that diecast aluminum alloys. A possible exception is the use of Perfection radiant gas heaters to warm dies or keep them hot during production lulls.



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Got a metallurgical problem? NBD specializes in bronze metallurgy and casting techniques; has developed over 40 special alloys for gear blanks, bushings, bearings, pump components and other parts.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 105.

Induction Heating

A profit capacity analysis on induction heating shows where production economies are possible with induction heat. The bulletin covers: forging, extrusion, brazing, heat treating, metal joining, etc. (Magnethermic Corp.)
For free copy circle No. 1 on postcard, p. 105

Flame Cutters

Flame-cutting machines are described in a 28-page catalog. Machines range from small portable ones to large multi-blowpipe shape cutters. (Linde Co.)
For free copy circle No. 2 on postcard, p. 105

Immersible Motor

Designed for submerged operation, a new immersible motor is described in a 4-page bulletin. The motor runs well in water, chemicals, abrasive oils and sewage sumps. (The Louis Allis Co.)
For free copy circle No. 3 on postcard, p. 105

Silicone Products

Major silicone products available from a major manufacturer are outlined in an 8-page catalog. They include: rubber, fluids, resins, water repellants, electrical insulation, release agents, lubricants, paint vehicles, and antifoam agents. (Silicone Products Dept., General Electric Co.)
For free copy circle No. 4 on postcard, p. 105

Vibrating Feeders

Air-operated vibratory feeders are covered in a bulletin. Available in 24-in. to 15-ft lengths, these feeders closely control feeding rates. (Cleveland Vibrator Co.)
For free copy circle No. 5 on postcard, p. 105

Steel Handling

An improved method of handling structural steel is outlined in a report. Adoption of this method can cut handling costs 50 pct, it says. (Towmotor Corp.)
For free copy circle No. 6 on postcard, p. 105

Stud Weld Fastener

A 10-page folder introduces a new low cost stud-welded fastener. This fastener is especially for joining single-sheet, non-insulated corrugated metal. (Nelson Stud Welding Div., Gregory Industries, Inc.)
For free copy circle No. 7 on postcard, p. 105

Plant Locations

If you're looking for a plant location with adequate power generation facilities for the future, a 4-page folder may interest you. Published by a group of firms planning a billion dollars worth of new power stations, the folder covers: (1) A "power pool"; (2) new hydroelectric starts; (3) transmission facilities;

(4) future atomic power plans. (Puget Sound Utilities Council).
For free copy circle No. 8 on postcard, p. 105

Scrap Baler

A specifications sheet and a folder describe a new baler. This unit can take an entire automobile and compress it into a neat metal bundle. (The Wheland Co.)
For free copy circle No. 9 on postcard, p. 105

Cut-down Machine

Hairline accuracy is promised for an angle cutting cut-down machine in a bulletin. Cutting ferrous and nonferrous materials, the saw demands no time waste in precision setting for compound angles. Built-in accuracy eliminates costly setting errors. (Irvington Machine Works).
For free copy circle No. 10 on postcard, p. 105

Drilling-Layout Unit

Specifications of a new drilling-layout machine appear in a 4-page catalog. The table-top machine saves up to 50 pct of the time normally required to make sheet metal layouts and templates, the catalog says. The unit eliminates need for a base line drawing and vernier height gage layout. (Wales Strippit Co.)
For free copy circle No. 11 on postcard, p. 105

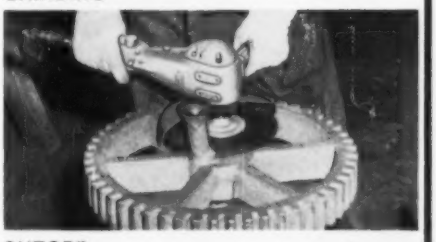
Couplings

Major products of a coupling manufacturer are reviewed in a 4-page bulletin. Products include standard gear couplings, flexible ones, and a nylon gear coupling which needs no lubrication. (John Waldron Corp.)
For free copy circle No. 12 on postcard, p. 105

Fellowship

Details of a foundry fellowship program appear in an 8-page brochure. Some 50 fellowships within the next ten years (value of each: $1500) are to be awarded. Grants are available for advanced study in science, business and engineering

GRINDING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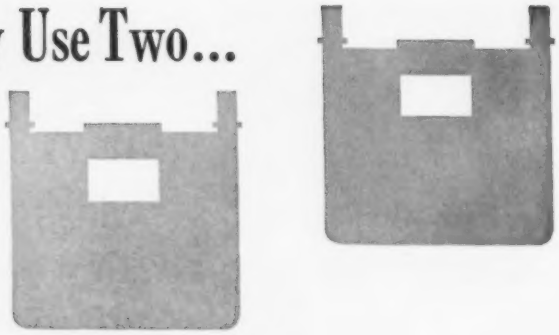
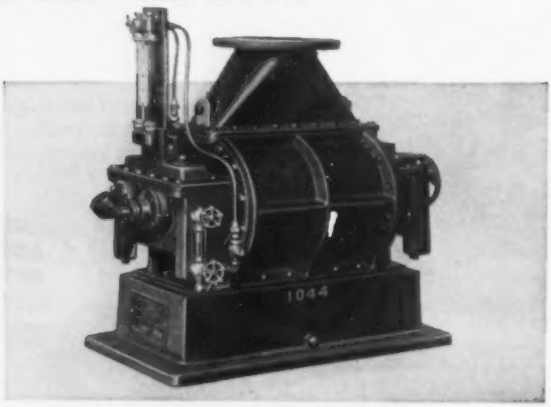


When One Will Do...



Better!

When *one* Roots-Connersville rotary gas meter is used in place of *two* . . . or *three* . . . or *four* of other types, metering costs go down.

This fact has been proved by utility companies and commercial and industrial users of gas everywhere as shown in this typical comparison:

Comparative Analysis	SPACE OCCUPIED	TOTAL CAPACITY	METER COST	INSTALLING COST	TOTAL COST
FOUR DIAPHRAGM METERS					
ONE R-C METER					

First cost is substantially reduced with the proper selection of the *one* Roots-Connersville meter, from the 39 sizes offered, for a specific requirement. Further savings are made in foundation, piping and installing costs, and in space.

But this is only part of the story. Roots-Connersville gas meters assure unalterable accuracy with far less maintenance than required by other types. There are no valves, valve gear or other small parts to wear out and cause inaccuracies. Servicing is limited to lubrication of bearings and gears and an occasional check of the operating differential.

For additional data, please refer to our section in **Chemical Engineering Catalog** or **Mechanical Catalog** or write for descriptive Bulletin M-152.

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FREE LITERATURE

related to the cast metals industry. (Wheelabrator Corp.)
For free copy circle No. 13 on postcard, p. 105

Throw-away Tools

A 12-page booklet illustrates a new holder for throw-away tools. It features an automatic chip breaker. (Sandvik Steel, Inc.)
For free copy circle No. 14 on postcard, p. 105

Jig Borers

Advanced design jig borers are featured in a pair of bulletins. They describe models with table working spaces of 20 x 40 in. and 12 x 22 in., respectively. Cross travels are 18 and 12 in. Longitudinal travels are 35 and 18 in. Spindle speeds: 45 to 1980 rpm; 35 to 2000 rpm. (Atlantic Machine Tool Works, Inc.)
For free copy circle No. 15 on postcard, p. 105

Panel Fasteners

Two technical bulletins contain data on quick-action stressed panel fasteners. A 3-page bulletin describes fasteners; a 9-page one gives results of qualifications tests. (Waldes Kohinoor, Inc.)
For free copy circle No. 16 on postcard, p. 105

Drafting Aids

Handy for drafting, advertising and display work, new shading films are described in a 6-page folder. Some 70 shading films are listed, along with 26 special symbols for map-making, etc. (Chart-Pak, Inc.)
For free copy circle No. 17 on postcard, p. 105

Hardness Tester

Combination hardness testers are described in a data sheet. This Rockwell and Rockwell Superficial tester combination can be used in laboratories, tool departments, small-lot job shops. (Wilson Mechanical Instrument Div., American Chain & Cable Co., Inc.)
For free copy circle No. 18 on postcard, p. 105

Alemite Portable Lubricator Saves 95 Man-Hours For Every Drum of Lubricant Applied!

Every point of lubrication in your plant can cost you needless time and money if you use old-fashioned hand lubrication methods!

With this Alemite portable air-powered lubricator, you save *95 man hours* for every 400-lb. drum of lubricant applied. Over *two* weeks of one man's time saved. That's how you can cut maintenance costs with Alemite.

In addition, Alemite's Model "711-A" is so compact and portable that it can bring clean, waste-free lubrication to *any* machine—*anywhere* in your plant—reducing machine downtime and prolonging machine life. Its pivot-swing dolly holds container upright at any pulling angle for easy moving over rough ground, indoors over rough floors, even up and down steps!

Step up to fast-moving, time-saving lubrication methods! Check Alemite's complete line of air-powered and electric-powered lubrication equipment for industry.

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This is a typical example of how American Welding's experience in forming and welding of stainless, aluminum, titanium and heat-resistant alloys has helped others cut production costs — and may be able to help you.
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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Machine Tools

Completely new, a 36-page catalog covers a major line of milling, grinding and screw machines. (Brown & Sharpe Mfg. Co.)

For free copy circle No. 19 on postcard

Hand Trucks

A new circular attempts to simplify selecting of hand lift trucks. It includes helpful selection data and tips on where and how to best use certain hand trucks. (Lewis-Shepard Products, Inc.)

For free copy circle No. 20 on postcard

Marking Machines

Machines for marking items ranging from transistors and 110° TV tubes to instrument scales and spaghetti tubing are described in an 8-page catalog. (Markem Machine Co.)

For free copy circle No. 21 on postcard

DC Controls

Technical information on rectifiers, capacitors and semiconductors is contained in a 4-page bulletin. It features rectifiers which provide flexible direct-current controls. Another section deals with the history of tantalum capacitors. (Fansteel Metallurgical Corp.)

For free copy circle No. 22 on postcard

Nuclear Valves

Cast stainless steel valves and fitting for nuclear installations are covered in a 4-page brochure. Facilities and quality control procedures including X-ray, metallographic, and spectrometer used to produce cast components designed for 2600 psi service at 670°F are described. (Nuclear Products Div., Cooper Alloy Corp.)

For free copy circle No. 38 on postcard

Business' Future

An illustrated 24-page booklet spells out the positive factors in this nation's growth and potential. It cites a growing U. S. population, more job opportunities, greater income, increased production, higher savings and broader research. (The Advertising Council).

For free copy circle No. 24 on postcard

Transformer

A dozen-page catalog announces a newly designed over-all self-protected electrical transformer. (Delta-Star Electric Div., H. K. Porter Co., Inc.)

For free copy circle No. 25 on postcard

Bronze Castings

A booklet contains a comprehensive discussion of advantages of centrifugal castings of bronze and copper parts for a wide range of applications. (American Brake Shoe Co.)

For free copy circle No. 26 on postcard

Stamping

Stamping of a chromium-molybdenum alloyed gray iron is discussed in a data file. (Advance Foundry Co.)

For free copy circle No. 27 on postcard

Stainless Fasteners

More than 7000 stainless steel fasteners are covered in a price catalog. It lists nuts, screws, washers and other type fasteners. (Star Stainless Screw Co.)

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Electric Hoists

An 8-page section of a new electric hoist and car puller catalog

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **6/12/58**

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FREE LITERATURE

gives a detailed description of seven specific steps which should be taken to insure the selection of the one type of electric wire rope hoist best suited to meet your requirements. (American Engineering Co.)

For free copy circle No. 29 on postcard

Industrial Gloves

Illustrated, a 17 x 22-in. wall chart with an easy-to-read index displays a line of industrial gloves. It gives all necessary specifications of each model as to material, weight, size, etc. (Pioneer Rubber Co.)

For free copy circle No. 30 on postcard

Seamless Tubing

Seamless steel tubing in aircraft and aircraft mechanical grades is covered in a mill stock list. It lists round, square, elliptical, rectangular, hexagonal and streamlined cross sections. (For free copy write on company letterhead to Ohio Seamless Tube Div., Copperweld Steel Co., Dept. 1612, Shelby Ohio.)

Vacuum Melting

Extensive vacuum arc melting services of a metallurgical job shop are reviewed in a 12-page booklet. Also handling custom casting jobs, this company specializes in reactive metals and super alloys. (Oregon Metallurgical Corp.)

For free copy circle No. 31 on postcard

Battery Service

Servicing of batteries for materials handlers is discussed in a manual. Tools, testing methods, charging and repairs are dealt with. (C & D Batteries, Inc.)

For free copy circle No. 32 on postcard

Welding Torch

A great variety of attachments for a universal welding torch are pictured on a handy chart. It shows attachments and tips for welding and for cutting with acetylene; ones for natural, city, propane and butane uses are depicted, too. (Harris Calorific Co.)

For free copy circle No. 33 on postcard

Self-lock Screws

Self-locking set screws in 1001 availabilities are listed on a new chart. It shows the wide scope of set screw combinations in metals, locking actions, drives, points and sizes available from one supplier. (Set Screw & Mfg. Co.)

For free copy circle No. 34 on postcard

Moisture Gage

Wide range, low cost instruments for accurately measuring minute quantities of moisture in gaseous mixtures are described in a bulletin. (Consolidated Electrodynamics Corp.)

For free copy circle No. 35 on postcard

Air, Gas Dryer

A new concept in air and gas drying is announced in a 4-page bulletin. It introduces a simple, compact dryer that gives continuous operation with low maintenance. (C. I. Hayes, Inc.)

For free copy circle No. 36 on postcard

Air Hoists

Air hoists are featured in a 4-page manual. It presents tables on rate of ascent and decent under various load conditions and air pressures for these new lightweight, 1000-lb chain hoists. (Thor Power Tool Co.)

For free copy circle No. 37 on postcard

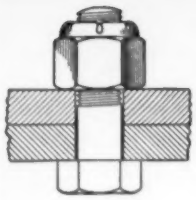
Snagging Wheels

A 16-page snagging handbook is designed to aid foundries, metal fabricators and steel mills. The useful booklet grinds no axes by constantly plugging the publisher's products. Instead, it offers helpful facts and hints on snagging with abrasive wheels. (Peninsular Grinding Wheel Sales Corp.)

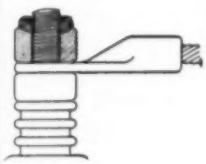
For free copy circle No. 38 on postcard

Ten fastening problems solved by ELASTIC STOP® nuts

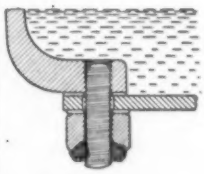
TIGHTENED AGAINST THE WORK



Vibration and impact proof bolted connections in standard applications.

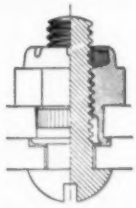


On all electrical terminals subjected to vibration in transit or operation, and for any electrical or electronic assembly where positive contact must be maintained.

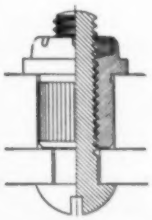


To seal bolt threads where leakage past stud threads must be prevented.

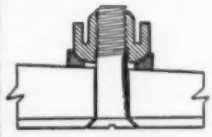
FOR MANY SPECIAL FUNCTIONS



Blind fastening applications where nut is "clinched" into sheet metal . . . becoming self-retaining as well as self-locking.

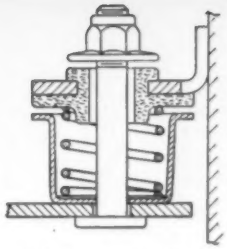


To eliminate drilling and tapping and provide steel thread strength for soft metals, an ESNA spline nut is pressed into a bored hole in casting.

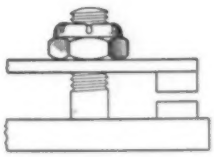


Simplified self-aligning self-locking fastener for bolting two non-parallel surfaces.

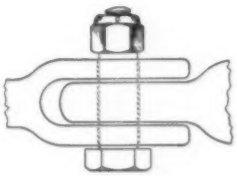
LOCKED ANYWHERE ON THE BOLT



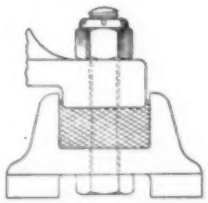
Spring-mounted connections or dynamic balancing, where nut must stay put yet be easily adjusted. (Flanged face eliminates need for extra washers.)



On make and break adjustment studs where accurate contact gaps must be maintained. Note "thin" height design for limited clearance.



For bolted connections requiring predetermined play.



For rubber-insulated and cushion mountings where the nut must not work up or down.

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The red locking collar of an ELASTIC STOP® nut grips bolt threads with a perfect fit that will not loosen under severe vibration or stress reversals, and seals against liquid seepage. By bringing nut and bolt metal thread flanks into firm contact it eliminates wear producing axial play. The elastic locking action of the insert-type stop nut does not distort or gall bolt threads. It is reusable many times.

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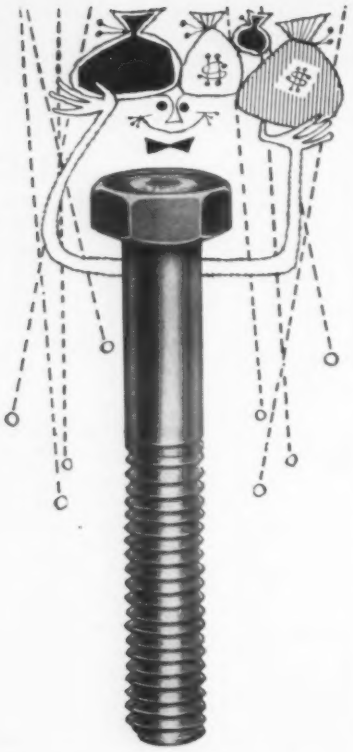

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You Arbitrate It!

SUMMER HELP

From the files of
The American Arbitration Association

The contract between a union and a metal furniture company said no new employees were to be hired while workers with seniority were on layoff. However, it had been management practice to hire college boys for temporary laboring work during summer months. The personnel manager always cleared this procedure with the union president and the latter never objected.

But in the summer of 1957, things were different. The temporary help were for clean-up work. The union was sure some regular female employees in the hardware packing department who were on layoff could do the work just as well as the college boys. So the union president refused to okay the deal. When the company hired some temporary help anyway, a grievance was filed.

Contract Clear — Eventually it went to arbitration under the rules of the American Arbitration Assn. The union case rested almost exclusively on the contract clause. The company admitted the contract was clear on this point. But it insisted the agreement was superseded by past practice. "All we're doing is what we've been doing every year for the past five," the personnel manager said. "The union can't object to it all of a sudden."

"We let it pass on a year-to-year basis. That's not the same as waiving our contractual rights forever," answered the international representative of the union. How would you rule?

The Arbitrator Ruled:

"A written agreement which is clear on its face can be modified only in writing. Past practice may properly be invoked to determine the intent of an unclear provision but it may not be invoked to vitiate the terms of an unambiguous provision, especially in circumstances where deviation from the agreement's terms occurred after specific

(Continued on following page)

NEW BOOKS

"Tool and Die Drafting" is for use both by those who know nothing about the subject and those who know plenty about it. This practical manual supplies apprentices and students with a good, basic text—draftsmen with a handy review. 184 pp. Royalle Publishing Co., 15818 Fielding, Detroit 23, Mich.

"How to Increase Your Sales Volume as a Manufacturers' Agent" is a handbook with a self-explaining title. Its author, Marvin Leffer, was educational committee chairman of the Manufacturers' Agents National Assn. 197 pp. $4.95 per copy. Prentice-Hall, Inc., 70 Fifth Ave., New York 11.

"Principles & Application of Heat Treatment for Titanium Alloys" by Battelle Memorial Institute researchers covers data gained from various heat-treat tests. 132 pp. PB 121636. $3.50 per copy. Office of Technical Services, Commerce Dept., Washington 25, D. C.

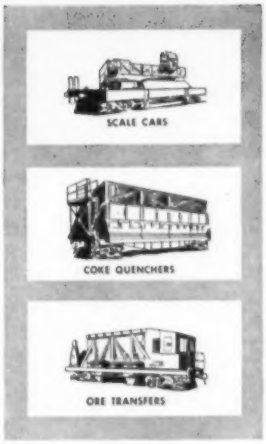
"Metallurgical Aspects of The Control of Quality in Non-Ferrous Castings" is based on a 1957 symposium held in London. It contains several technical articles on quality control of aluminum, copper, magnesium, nickel and related alloy castings. 148 pp. The Institute of Metals, 17 Belgrave Sq., London, S.W.1, England.

The Arbitrator Ruled:

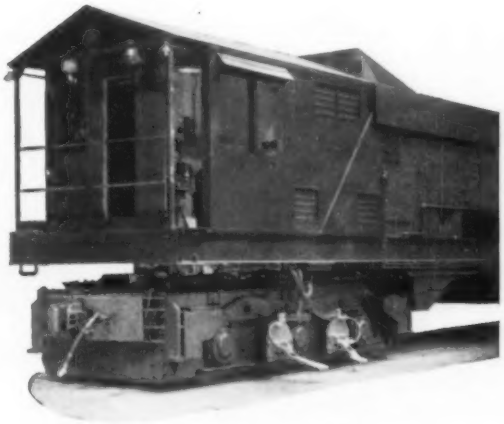
(Continued)

notice to the union and with the union's consent." The union won the case. Since the arbitrator's opinion was that the women could have performed the clean-up work, they were reimbursed.

Caution: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.



sixty years of car building progress with an international reputation for quality.



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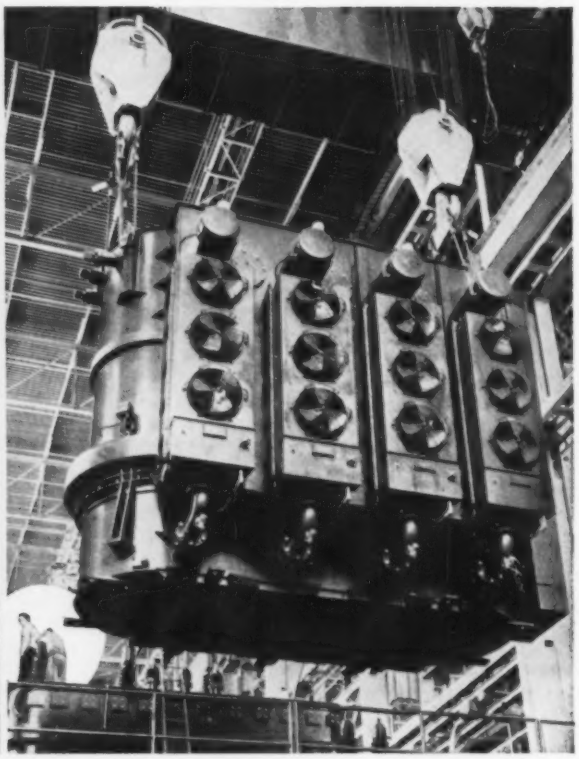

Why different loads require different slings

Your rigger knows that different loads need different slings because of varying factors such as shape, weight, material, finish, protruding sharp corners, extremes of temperature.

On some jobs chain is best. On others the characteristics of wire rope make it the first choice. On still other jobs, wise riggers know that combinations of chain and wire rope will provide the greatest lifting economy.

No matter what type is called for, you can be sure of the safest slings and the best values in ACCO *Registered* Slings. From this one source you can get unbiased information based on actual know-how.

And you can get the exact slings your rigger should have.

One of the recent improvements is the new shaped Master Link now provided without extra cost on all ACCO *Registered* Slings, chain or wire rope. This link gives 18% greater resistance to distortion with no increase in weight. It is another reason why ACCO *Registered* Slings are recognized as the standard of efficiency and safety.

All ACCO *Registered* Slings are proof-tested, registered and identified for your greater assurance of safety.

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5. Metal identification ring or tag on each sling
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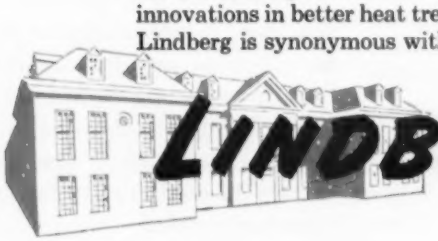
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

How to find a better heat-treating method

Here's a sound way to do it. Take your problems to the people who have consistently, over the years, provided the metal treating industry with new and better ideas, more efficient, more practical equipment. This will bring you to Lindberg, creators of the famous Cyclone type atmosphere furnaces, the long-life "dimple" vertical radiant tube, the revolutionary new CORRTHERM electric heating element and so many other innovations in better heat treating methods. Lindberg is synonymous with heat treating furnaces. We build them for carbonitriding, carburizing, hardening, tempering, normalizing, bright stainless annealing, brazing, carbon correction, nitriding, or any other metal treating requirement. Give your production processes the advantages of Lindberg's forward look in "heat for industry" techniques. Get in touch with your nearest Lindberg Field Representative (See classified phone book) or write Heat Treating Furnace Division, Lindberg Engineering Company, 2452 W. Hubbard St., Chicago 12, Illinois.



LINDBERG heat for industry

Alloy Withstands Heat, Corrosion

Baskets which hold pieces during heat treatment really take a beating.

A new lightweight alloy has long life under such punishment.

▪ Working closely with heat treating firms, an equipment maker has come up with an alloy basket that withstands terrific around-the-clock punishment. Made of RA330 alloy welded with RA330-80 electrodes, the basket boasts long service life under difficult heat and corrosion problems.

Developed by Aluminum & Architectural Metals Co., Detroit, with the aid of many major heat-treating companies, the extra-strong basket resists carburizing and carbon-nitriding atmospheres followed by a direct oil quench. Accommodating a variety of parts to be heat-treated, the basket contains inserts for fixturing different types of work.

Alloy Doesn't Distort—The alloy and electrodes can be used for boxes, trays, baskets, fixtures and retorts. After months of steady use, test alloy baskets show only slight distortion, so slight they do not need repairs or straightening. Baskets made from a previously-used alloy warped, requiring frequent and expensive maintenance.

Tests indicate the alloy has the following advantages: (1) It's light in weight due to high strength; (2) Life is up to six months longer than a previously used fabricating material; (3) Welded joints are sound; (4) It's relatively easy to fabricate; (5) It stands up well under 1500 to 1800°F destructive atmospheres with direct quench, six days a week, 24 hours a day.

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Fabricating

Litho-embossing method gives sheet metal a "fabric" look

Employing a new corrugating-lithographing process, a fabricator produces sheet metal with the appearance of fabric. The end product possesses the illusion of woven cloth.

Almost any metal can be embossed with the fabric look, says Croname, Inc., Chicago, which is currently putting such finishes on 16 x 31-in. aluminum sheets and some fabricated parts. Lacquered and baked after imprinting, the finished stock can be reasonably machined or formed. It can also be perforated for sound, air, or light transmission.

Because the "fabric" is all metal, it cleans easily with a damp cloth. The fabricator can produce it in

Patterns like these look like cloth, but are actually metal.

many colors, textures and weave patterns, such as tweed, bark cloth or twill.

Welding

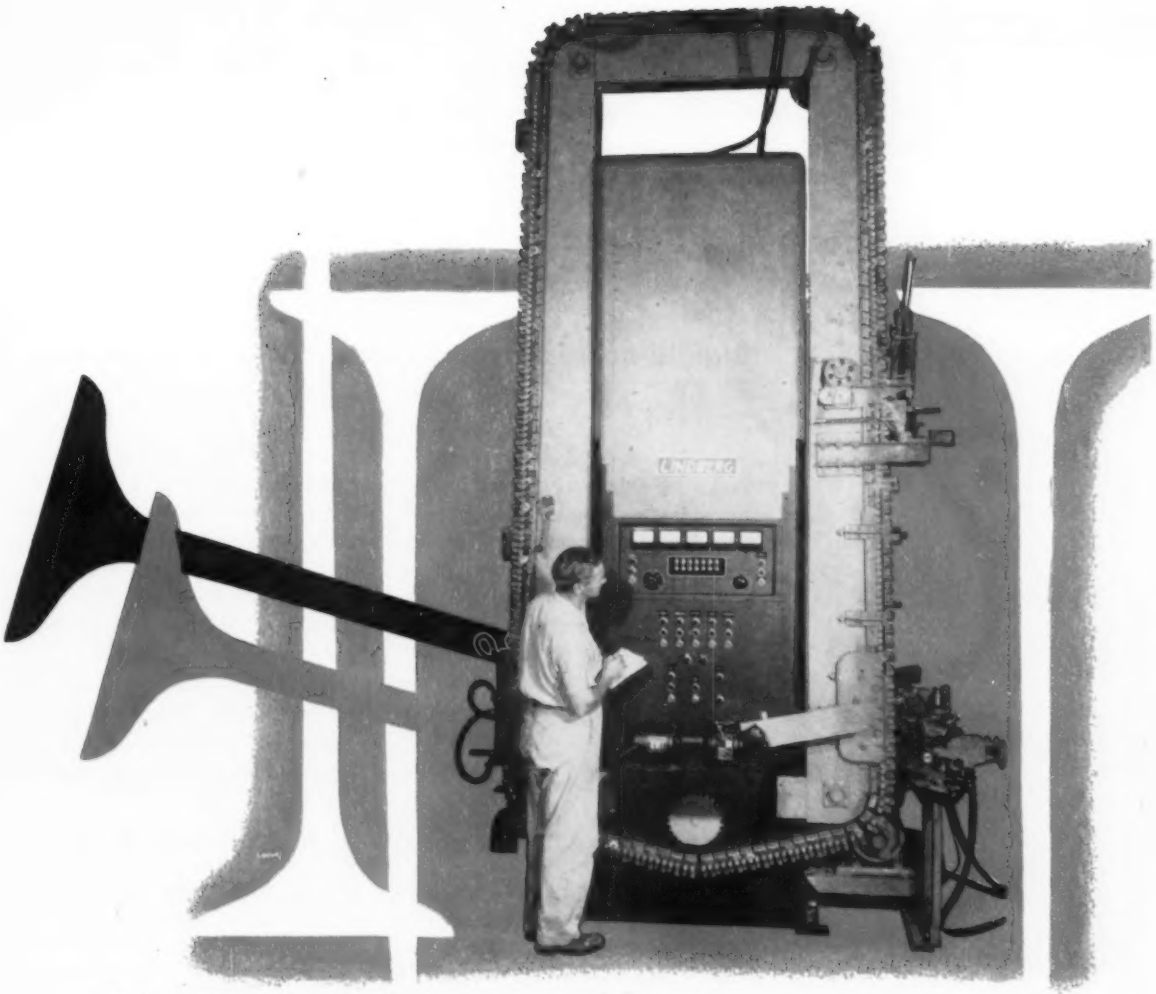
Using a new welding technique, a new unit butt seam welds foil. It makes smooth, non-overlapping seam welds of dense structure and high strength, at high speeds. Welds have been made on 0.078-in. stock at 3 to 24 fpm.

Because it requires less heat and pressure than mash welding, the unit uses less power. Another feature: very little warping of sheets. It welds mild steel, low alloy, high carbon and stainless steel.

Precision welder and Flexopress Corp., Cincinnati, is the new foil welder's manufacturer.

Want More Data?

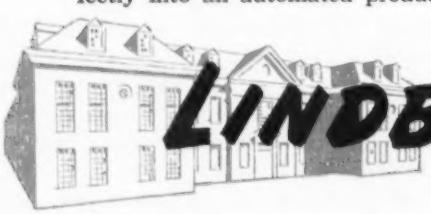
You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Lindberg pioneers in High Frequency Heating

Along with its pioneering in all phases of "heat for industry" Lindberg is one of the largest makers of High Frequency heating units. Our "H-F" designers and engineers have made outstanding developments in this important heat treating field. For example, we illustrate a remarkable unit just recently completed for aluminizing automotive valves. It was designed vertically, saving 60% of floor space, and is completely automatic. No operator is required. It fits perfectly into an automated production line.

Our High Frequency Division provides units for hardening, brazing, heating for forging and forming, annealing and many other processes, and designs a variety of fixtures for application to "H-F" units. Lindberg also supplies a complete line of motor generators for all induction heating and melting applications. Get in touch with your nearest Lindberg Field Representative (See classified phone book) or write High Frequency Division, Lindberg Engineering Company, 2452 W. Hubbard St., Chicago 12, Illinois.



LINDBERG heat for industry

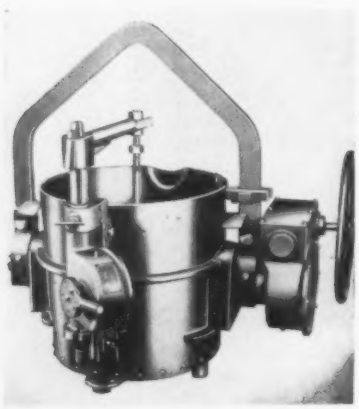
New Production Ideas

Equipment, Methods and Services

Big Jig Borer Accommodates 70-in. Workpieces

Accommodation of 70-in. workpieces is boasted of this precision jig borer. Designed for manufacturers whose requirements include machining or inspecting large components with extreme precision, the new machine tool is capable of locating accurately to ±0.0001 in. It can bore to the center of a 80-in. diam workpiece. Models are available with numerical or manual control. The jig borer provides a combined head and quill travel of 64 in. As a result, the spindle nose can be brought within 6 in. of the table working surface. Thinner work can be handled without using sub-tables; these could result in inaccuracy. Despite its high column, the jig borer has a vertical alignment over its entire 64-in. travel equal in accuracy to that of all other borers turned out by its maker. This is due to a newly-designed column construction with the counterbalances supported by an independent structure. (Pratt & Whitney Co.)

For more data circle No. 39 on postcard, p. 105



Bottom Discharge Ladles Pour Slag-free Metal

Large quantities of slag-free metal are poured by bottom discharge crane ladles recently designed. The ladles feature a geared discharged mechanism especially engineered to reduce ladle space requirements and promote foundry safety and convenience. The new design provides 18 lever positions for adjusting the operating lever to proper height for safe, easy pouring. Its lift column can be securely clamped at any desired height. The gear unit, oil tight and dustproof, operates in a continuous oil bath, with efficient oil seals to assure a leakproof assembly. The gear housing cover is gasketed and bolted to the rear of the unit for trouble-free maintenance. The end of the cross arm accommodating the stopper rod is slotted to allow liberal adjustment. The new ladles come in four models. (Industrial Equipment Co.)

For more data circle No. 40 on postcard, p. 105

Non-technical Personnel Can Run Computer

This single-address, fixed point, binary stored program automatic electronic computer can be used by non-technical personnel, trained quickly to carry out actual computer runs. Its integrated logical design uses comparatively few components. This results in a unit of substantial capacity that fits into a desk-size space. It's just 26-in. deep, 33 high, 44 long, exclusive of an electric punched paper tape typewriter and shelf. The computer weighs 800 lb. It plugs into an ordinary wall outlet and requires no special installation or external air conditioning equipment. The computer can solve engineering and scientific problems of extreme complexity, its maker says; the range of calculations it can perform is almost limitless. (Royal McBee Corp.)

For more data circle No. 41 on postcard, p. 105

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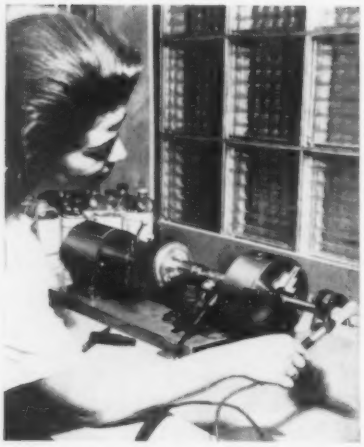


Turning Head Aids Selective Plating Work

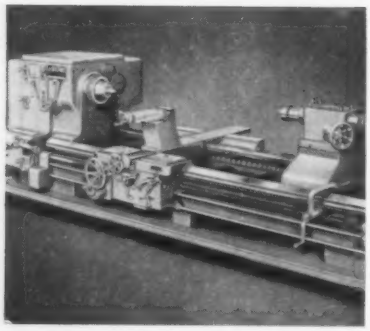
To simplify selective plating of circular or cylindrical components, a plating materials supplier has introduced this special low-speed turning head. It includes a variable speed control, for infinite adjustment of rotation from zero to 400 rpm, in either direction. Therefore, correct tool-to-surface speed, which depends on the plating solution being used, is achieved very easily. The range of speeds has been selected by the manufacturer to handle 90 pct of the work normally selectively plated. Overloading the turning head is almost impossible; the only restraining force on the shaft is the friction between the cotton-wrapped stylus anode and the workpiece. However, to guard the speed reducer in case the chuck is rotated by hand for positioning, automatic torque overload protection is also included. (Marlane Development Co.)

For more data circle No. 42 on postcard, p. 105

Wire Rope Combines Advantages of Two Types

A new type wire rope combines flexibility and abrasion resistance of Lang lay rope with the stability of regular lay rope under severe operating conditions. This "herringbone" wire rope employs two pairs of Lang lay strands and two strands of regular lay. It has relatively large outside wire construction to take the pressure and abrasion of contact with sheaves and drums, combined with smaller inside wire construction so patterned as to give high flexibility in service. Performance of the "herringbone" wire rope over a 3-year field test shows it gives good service as shovel ropes, wagon scraper ropes, dragline ropes, holding and closing lines, and for general hoisting. Field tests on excavating equipment indicate that performance is high even when equipment is being used by unskilled operators. (John A. Roebling's Sons Corp.)

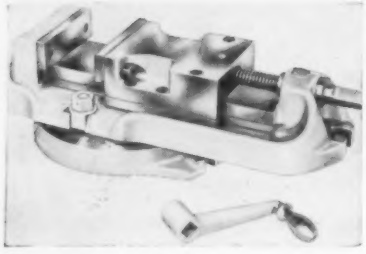
For more data circle No. 43 on postcard, p. 105



Lathes' Large Swing Accommodates Big Cylinders

Two new big-swing, relatively light horsepower lathes recently announced possess unusually large swing. Available up to 50 hp, the lathes can turn missile bodies and other large, cylindrical, tubular and fabricated parts. Their new wide bed design assures that cutting force is properly absorbed into the bed. One of the lathes has an extra wide bed and carriage; it swings up to 75 in. The other lathe has double-bed construction (two beds integrally cast in parallel) and is currently designed to swing up to 120 in., with center distance as required. Tracing mechanisms are available on both machines. (R. K. LeBlond Machine Tool Co.)

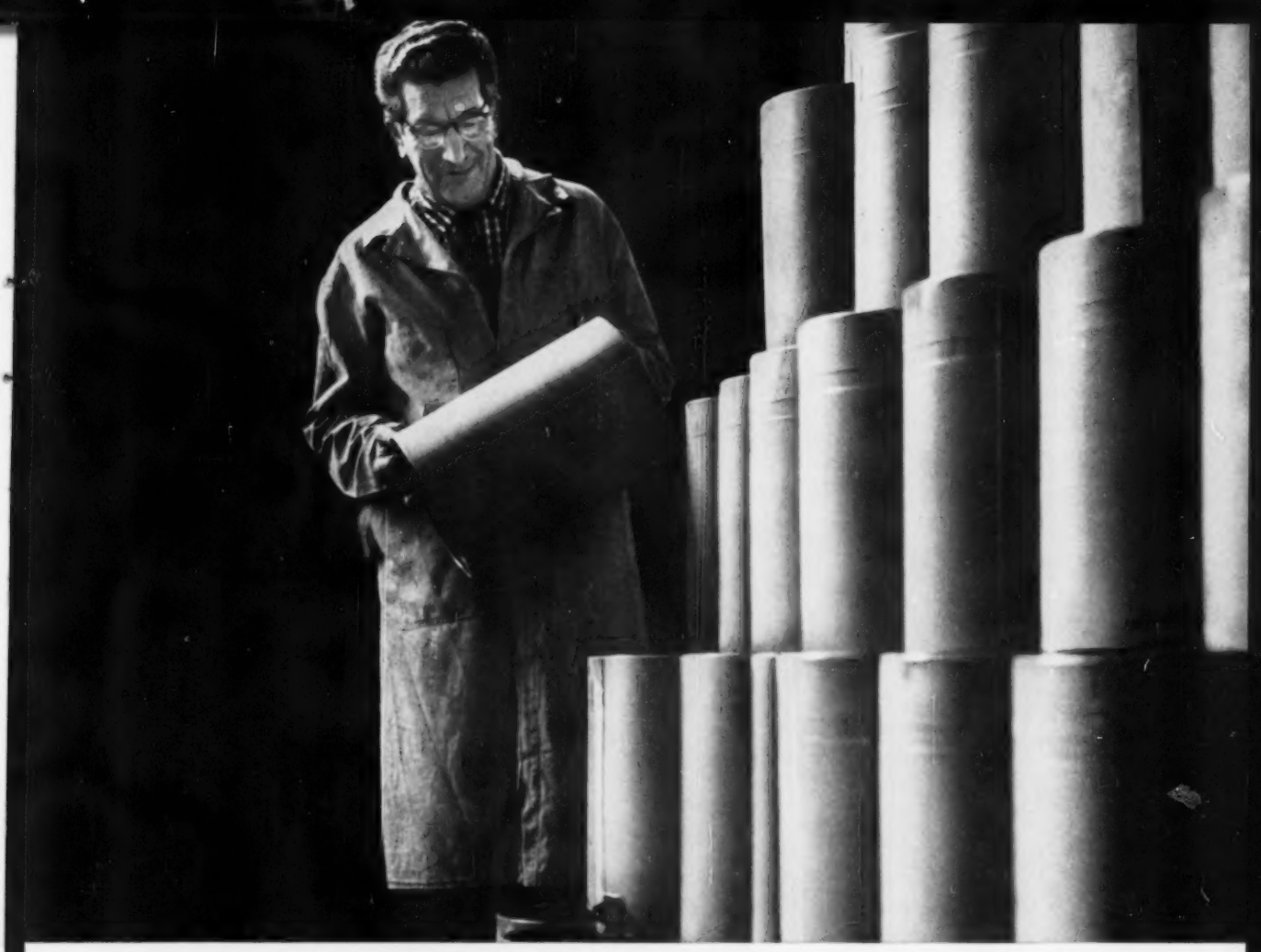
For more data circle No. 44 on postcard, p. 105



Wide-opening Vises Hold Work Securely

Vises in a new line offer big opening capacities for accurate machining of rough or finished workpieces. Vises come in five sizes: 4, 5, 6, 7 and 8 in. Opening capacity of each is the same as the width of the jaws. Their rugged, precision machined jaws ride across a smooth, unslotted body that keeps chips from getting under the movable jaws. Deep coolant troughs effectively return all coolant to the machine table. (Skinner Chuck Co.)

For more data circle No. 45 on postcard, p. 105



"WEIRZIN'S ZINC-COATED SURFACE DEFIES CORROSION—TAKES PAINT BEAUTIFULLY!"

REPORTS LINCOLN METAL PRODUCTS CORPORATION, MAKERS OF BEAUTYWARE

A leading manufacturer of such housewares as kitchen canister sets, bread boxes, step-on cans and towel dispensers, Lincoln Metal Products of Brooklyn, N. Y., finds Weirzin electrolytic zinc-coated steel a natural for its purposes.

"Inventory problems are simply non-existent," says a spokesman. "You can store stamped-out parts of Weirzin indefinitely—even for years without worrying." Because its electrolytically fused zinc coating is so tight, not even the severest bending, drawing or crimping operation will flake or peel off its surface during fabrication. No exposed steel—no corrosion problem!

Also you'll discover—as have Lincoln Metal Products and many other users—that appearance is not the only beauty of chemically treated Weirzin's paintability: the economy of that lasting paint job is one of its biggest drawing cards, too.

In the market for a metal that combines strength, economy and super-resistance to corrosion? You'll find it eminently worth your while to investigate Weirzin.

Free Booklet "Weirzin" Gives Complete Details. Write to Weirton Steel Company, Dept. A-19, Weirton, West Virginia

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

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NATIONAL STEEL CORPORATION

Copying Lathe

On a new 4-spindle copying lathe, the work is chucked between centers. Then both driving spindles and tailstock centers index together through the work positions. Template operated hydraulic copying slides perform copy turning. Slides can mount at three work stations. Copy slides have 12½-in. longitudinal stroke; they position to suit the job. Turning capacity: 7 in. Spindle speed: 300 to 1500 rpm. Motor capacity: 40-hp max. (New Britain Machine Co.)

For more data circle No. 46 on postcard, p. 105

Chromium Plating

A method of combining different semiconductor elements permits a new rectifier to reverse current etch prior to chromium plating in high amperage ratings. The rectifier permits output polarity reversal on units to 10,000 amp via a panel mounted switch or a push-button operated solenoid controlled air device Other assets: low initial cost; simple, inexpensive installation; occupies relatively little floor space; static operation, no moving parts to wear out or get out of alignment. (Sel-Rex Corp.)

For more data circle No. 47 on postcard, p. 105

ERIE Bolts • Studs • Cap Screws • Nuts
In Alloys • Stainless • Carbon • Bronze

Designers and engineers from every field of industry submit their exacting specifications to us for special fasteners to resist corrosion, extremes of temperature, tensile, fatigue, impact, and shear stresses. For more than 40 years our skilled craftsmen have met the requirements of construction and farm machinery, of transportation, refining and railroad equipment, the heavy machines of industry, pressure vessels, compressors, pumps, in widely diverse applications. We are prepared to serve you well. Send us your fastener specifications for prompt estimate.

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ERIE BOLT & NUT CO.
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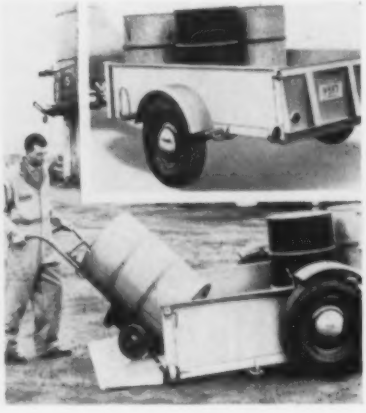
Elevating Trailer

For all-purpose cargo handling, this elevating trailer lifts its own load in 40 seconds. A hydraulically-run bed lowers to receive load at ground level. Then it lifts and locks into hauling position. A unique load leveling device compensates for non-uniform load



distribution, assuring level elevation or decent. Independent wheel suspension and dual leaftype springs provide shock free over-the-road cargo hauling. The tailgate forms a heavy-duty loading ramp as well as a secure box closure. Rated at 2000-lb capacity, the trailer is of all-steel construction. Weight: 960 lb. (Magline, Inc.)

For more data circle No. 48 on postcard, p. 105

Electrical Laminate

A flame-resistant laminated plastic offers excellent electrical properties, very high insulation resistance, and low moisture absorption. It comes as a standard laminated plastic and as copper clad material. (National Vulcanized Fibre Co.)

For more data circle No. 49 on postcard, p. 105

Continuous high production plus precision are built into this CTU cylindrical grinder.

You, too, can have the "Touch of Gold" with a Norton Grinding Machine

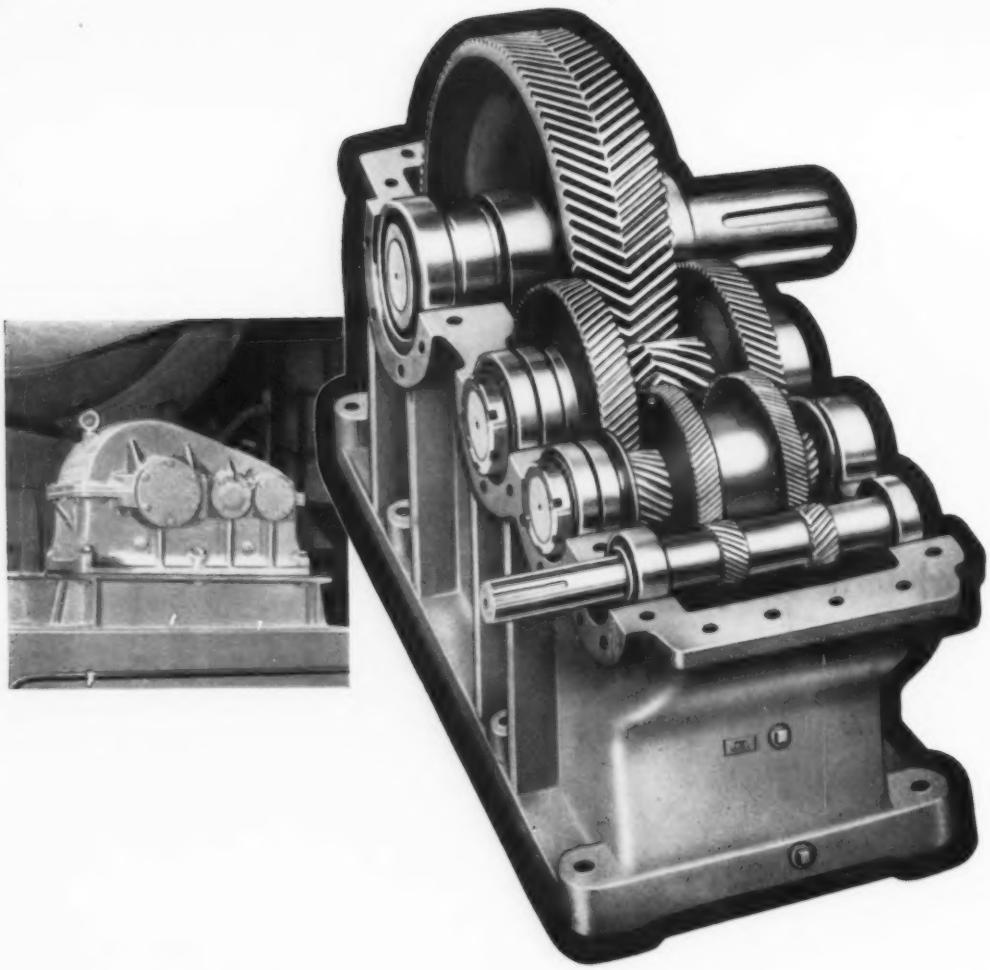
This is one of the most profitable machines industry knows. It is widely used for the demanding tasks of production precision cylindrical grinding. It is a product of Norton Company's ingenuity and knowledge of the great and varied science of grinding . . . one in which Norton has specialized for scores of years . . . a field in which it has become world leader.

You literally have the "Touch of Gold" when you use a Norton Grinder. Its ability to produce faster and with greater precision is added value that creates more wealth . . . helps everybody earn more.

It will pay you to inquire how Norton Grinding Machines and Lappers can give your company the "Touch of Gold." NORTON COMPANY, Worcester 6, Massachusetts.

NORTON
GRINDERS and LAPPERS

Making better products...to make your products better



THE HEAVIER THE LOAD . . . THE MORE YOU NEED

PHILADELPHIA HERRINGBONE REDUCERS

Heavy repeated shock loads . . . high horsepower . . . round-the-clock operation . . . put them together and you have the kind of a job where Philadelphia Herringbone Reducers perform best. They will last longer and save your maintenance dollars because extra strength is built into every part . . . housings, shafting, bearings and gearing.

To be specific:

Housings are specially reinforced at points of greatest stress. Extra heavy bearings take shocks and heavy overhung loads in stride. Result: shaft alignment is accurate . . . and it stays accurate. Gears, pinions and bearings last longer.

To meet the specific needs of each application, gearing is specially designed and symmetrically arranged in the housing. Result: the bearings on each shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

Pound for pound, horsepower for horsepower and dollar for dollar, you can't buy a herringbone reducer that will outlast a Philadelphia. They are designed with *your* heavy duty drive problems in mind . . . so that you will never have a drive problem.

Philadelphia Herringbone Reducers are available in single, double and triple reduction for ratios of 1.75:1 to 292:1. Write today for your copy of Catalog H-55.

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INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

Punch Press Works From Non-dimension Drawings

Using a new optical positioning system, this turret punch press accurately, rapidly locates and pierces holes via a non-dimensional full size drawing. The punch press reduces preparation time required to fabricate panels and other parts measuring up to 48 x 60 in. in a single press handling, or 48 x 120 in. in two handlings. Engineering time is minimized since detailed shop drawings are not required. Hole-to-hole and edge-to-hole dimensions are eliminated. Only the outside dimensions of the part are required. Parts can be produced as quickly as the easy-to-make drawings are released. This method is especially valuable for manufacturers producing short run work with repetitive drilling plans, common to most parts, but seldom falling in the same or relative location on any two panels. (Wiedmann Machine Co.)

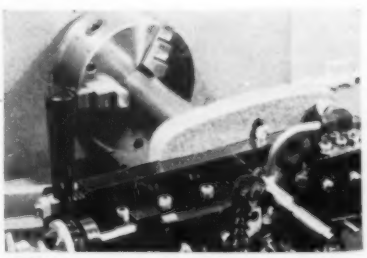
For more data circle No. 50 on postcard, p. 105

Multi-ram 8-ton Press Handles Gasket Cutting

For stamping, forming or trimming light gage or soft materials, this press was originally designed for a gasket manufacturer. But it can serve other operations as well, such as work on rubbed sheets, cloth, cork, light gage metals, plastics or metal foils. It's actually two presses in one unit. Both 8-ton capacity models have rams simultaneously run via a shaft equipped with universal joints at each end. Since the unit uses just one flywheel, total capacity remains at 8 tons. Center to center distances between rams is 45 in. This is sufficient to accommodate coil or sheet stock up to 37-in. wide between press-frame members. A special 3-in. thick bar bolts between both rams; this is reinforced by two curved ribs extending from one inner ram face to the other. Different stock width openings and ram center distances are available for specific applications. (Benchmaster Mfg. Co.)

For more data circle No. 51 on postcard, p. 105

Centerless Lathe Turns Any Length Parts



Fast, one pass, one plunge turning is promised for this multi-purpose precision centerless lathe. Turning is done without headstock or tailstock center support. Steady rests are also unnecessary. This is because the spindle collet and single point tool move along the bar stock as a unit. The lathe automatically produces workpieces of infinite lengths, tapers and contours within ±0.0005 in. (Taber Instrument Corp.)

For more data circle No. 52 on postcard, p. 105

Safety Hat Is Lightweight and Strong

Vertically taper ribbed, this aluminum safety cap is light in weight. And its girder-like construction makes it completely rigid. Of tough, tempered aluminum, it's cool because it reflects and does not absorb heat. The lightweight cap's "suspension" is of resilient, shock-absorbing, form-fitting polyethylene. It shapes to the wearer's head for ideal comfort and makes the cap "stay put" in any working position. The suspension "floats" the headband to avoid direct head contact with the cap shell and for full ventilation. The suspension is mildew proof. (Fibre-Metal Products Co.)

For more data circle No. 53 on postcard, p. 105

New **Longer-Wearing** Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using*.

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two *pairs* of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

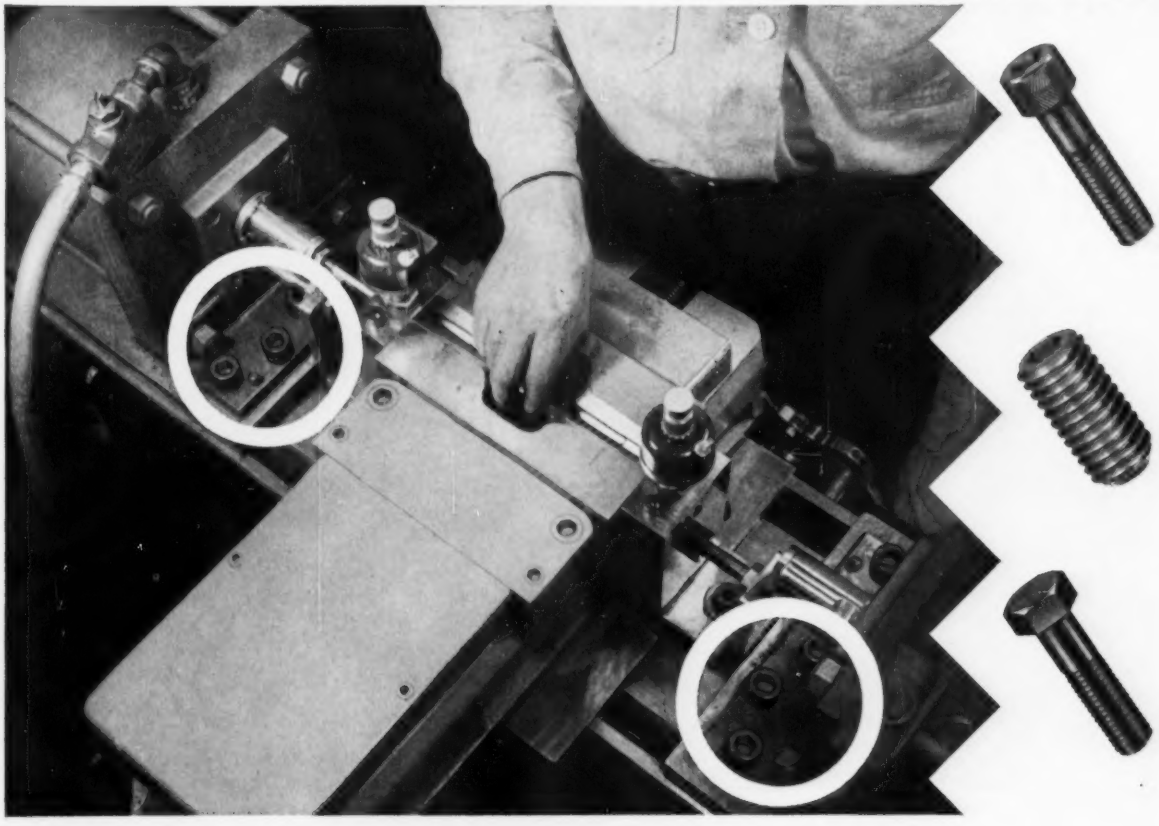
You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

IT PAYS TO STANDARDIZE ON **STANSCREW**



A 20-ton impact load . . . 14,400 times a day! Stanscrew Fasteners solve the problem

Fastening the air cylinders on this tube former is a real problem. Each of these 8" bore cylinders delivers a thrust of over 20 tons every time the machine is operated. And since this happens 14,400 times in a normal working day, ordinary fasteners would soon fail under these repeated shock loads. Furthermore, not even the slightest misalignment can be tolerated in this machine.

The Stanscrew fastener specialist was able to quickly answer this demanding problem. His solution was Stanscrew Socket Head Cap Screws, tightened to within 80% of yield strength so they remained in tension. These fasteners, so applied, deliver a clamping force that eliminates the shock feature of this extremely high loading . . . and provides a 100% factor of safety.

Tough assignments like this are everyday jobs for your Stanscrew fastener specialist. Immediately on call, through your Stanscrew distributor, he can bring to your problem years of specialized experience. And, back of him, is an outstanding staff of engineers who have been solving the fastener problems of American industry since 1872.

Stanscrew's complete line of more than 4,000 different types and sizes will provide economical answers to your fastener requirements. All 4,000 items are always in stock, quickly available.

Call your Stanscrew distributor today for solutions to your fastener problems. He will arrange a prompt meeting with the Stanscrew fastener specialist . . . who can often suggest ways to save you money by substituting standard fasteners for costly specials.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

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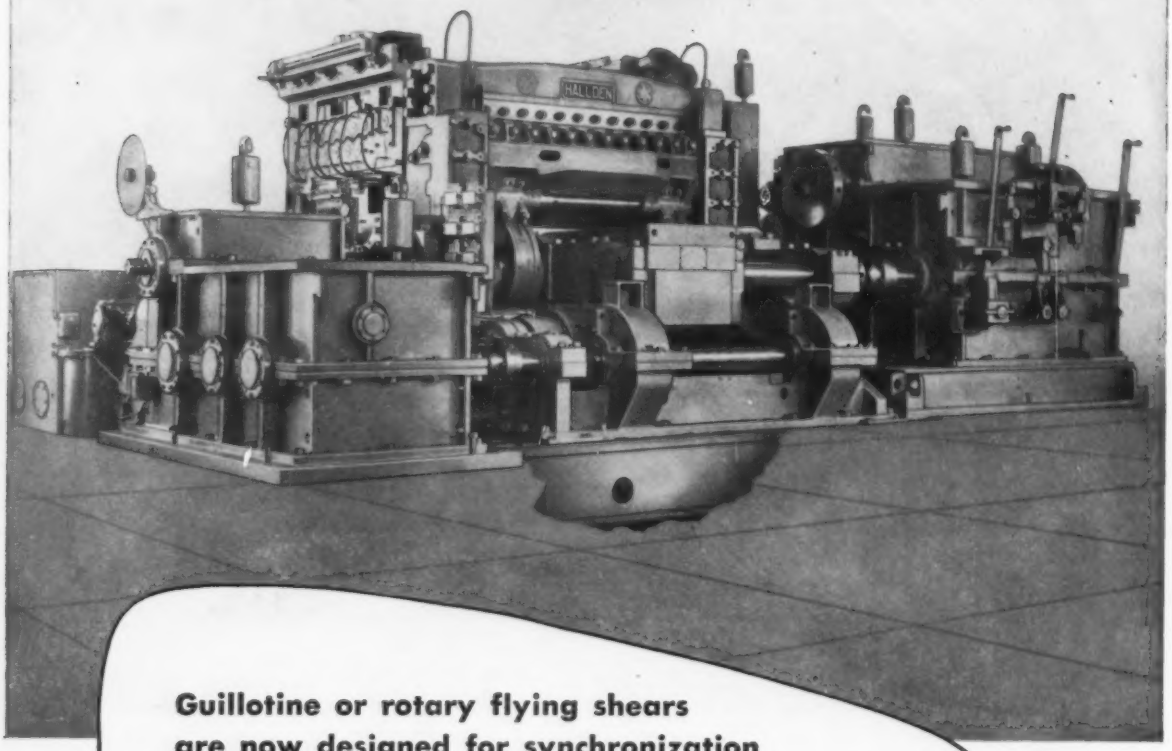
SYNCHRONIZED "On the Fly"



Guillotine or rotary flying shears are now designed for synchronization adjustment without stopping the machine.

Automatic Shears

designed and built by

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THE SHEARING SPECIALISTS

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The Iron Age Summary

Price Hedging Orders Jam Mills

Some last-minute orders too late to beat expected July price increase.

June rush will contribute to July letdown but improve chances of fall pickup.

■ The rush to beat the expected July steel price boost is jamming mill schedules. Steel users who were late in placing orders for June delivery will be disappointed.

Some orders will carry over into July, when the mills are expected to hike prices about $6 per ton as an offset to higher wage and fringe benefits.

Jockeying for Position — Some steel buyers are having trouble getting the mills to accept business for June delivery. For example: A plate user is battling to get on a June 16 rolling schedule, but has been told the best he can have is a June 23 rolling with delivery in July.

The June rush will contribute to the expected July letdown. Many steel users have merely moved up their July orders into June, which means their July requirements will be that much less.

Fall Upturn Seen—But the expected summer lull in steel demand probably will boost chances for a fall and winter upturn, barring a strike in the automotive industry. Steel user inventories are still dropping, and some users' stocks are scraping the bottom of the barrel.

Output of steel may reach 70 pct of capacity in the latter part of this month. All semi-finished inventory in the mills is gone, and producers are trying to get a little ahead of the finishing mills. While the current push is mostly price hedging, there is some basic improvement due to seasonal influences.

A Disappointment — However, the mills are disappointed that they are receiving little help from construction in the way of steel orders. While construction is running about the same as last year, steel orders are down and fabricator backlogs are dropping.

One big reason seems to be that most of the gain is in public construction, particularly public housing and highways. But industrial construction, which is the best market for steel and fabrication, is down from May, 1957.

Detroit Caution — In Detroit, automotive purchasing agents are buying cautiously. Much of the current spurt in Detroit steel output is due to automakers ordering to balance phase-out inventories for 1958 model production.

Auto companies apparently are not going any further out on the limb than they can help on orders for new model output. Steel men say they get the impression the car companies are much more conservative in their appraisal of initial '59 model production.

To meet local competition, Great Lakes Steel Corp. this week lowered its Detroit steel prices $2 a ton. Other mills are expected to follow suit. It may end for all time the Detroit area price differential.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,723	1,685	1,412	2,215
Ingot Index				
(1947-1949=100)	107.3	104.9	87.9	137.8
Operating Rates				
Chicago	70.0	69.0*	57.0	86.0
Pittsburgh	60.0	59.5*	53.5	88.5
Philadelphia	64.5	63.5*	56.0	101.0
Valley	46.0	40.0*	38.5	73.0
West	74.0	76.0*	72.0	103.0
Cleveland	36.0	36.0*	26.0	89.0
Buffalo	54.0	54.0	39.0	102.0
Detroit	63.0	66.0*	37.0	100.0
South	60.5	67.0	67.0	93.0
South Ohio River	62.0	61.0*	53.0	89.0
Upper Ohio River	76.5	78.0*	76.0	84.5
St. Louis	95.0	97.0	77.0	84.0
Northeast	35.5	35.5*	31.0	66.5
Aggregate	...	62.4	52.3	86.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	$66.49	$66.49	$66.49	$64.56
Scrap, No. 1 hvy (Gross Ton)	$35.50	$36.00	$32.67	$54.83
No. 2 bundles	$26.50	$26.83	$23.83	$46.33
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	10.80	11.30	11.80	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	95.125	94.50	94.75	98.375
Zinc, E. St. Louis	10.00	10.00	10.00	11.00

How Ford Plans Purchasing Policy

Harold H. Compson tells how Ford schedules steel orders in first of IRON AGE interviews with leading buyers.

Stick to established pattern, he cautions, and aim for regular, economical deliveries.

▪ Harold H. Compson is among the biggest of the nation's "big spenders." As purchasing agent in charge of the metal stamping and metal purchasing department at Ford Motor Co., he buys several million tons of steel each year. To complicate matters, the steel types and sizes used by the auto company number more than two thousand—just about everything available, according to Mr. Compson.

Keeping balanced inventories in a number of plants is always difficult, he says. And this year it has been even more difficult. However, he advises, "One of the best ways of holding problems to a minimum is sticking to your established purchasing policy. Companies which are always changing policy are the ones finding themselves most often in trouble."

Ford hasn't altered its basic purchasing policy since the last major changes were made in 1955. The present policy was developed from the ground up and is based on continuing experience as well as past experience.

Maintain Regular Deliveries — "The key to any good inventory policy," he points out, "is consistent, economical deliveries. Any 'float' requirement depends on the frequency and reliability with which we can expect economical deliveries."

With certain exceptions, he explains, Ford's policy is to carry inventories ranging from 15 days to 30 days supply. The largest number of items, but those in the smallest tonnages, are carried at the higher 30 days supply. The basic policy of 45 days lead time on steel orders has also remained unchanged through production ups and downs.

Possibility of a strike in the auto industry isn't able to influence Ford's buying practices either, according to Mr. Compson. "We don't plan for strikes. You can be wrong either way—plan, and then no strike; or don't plan, and have one."

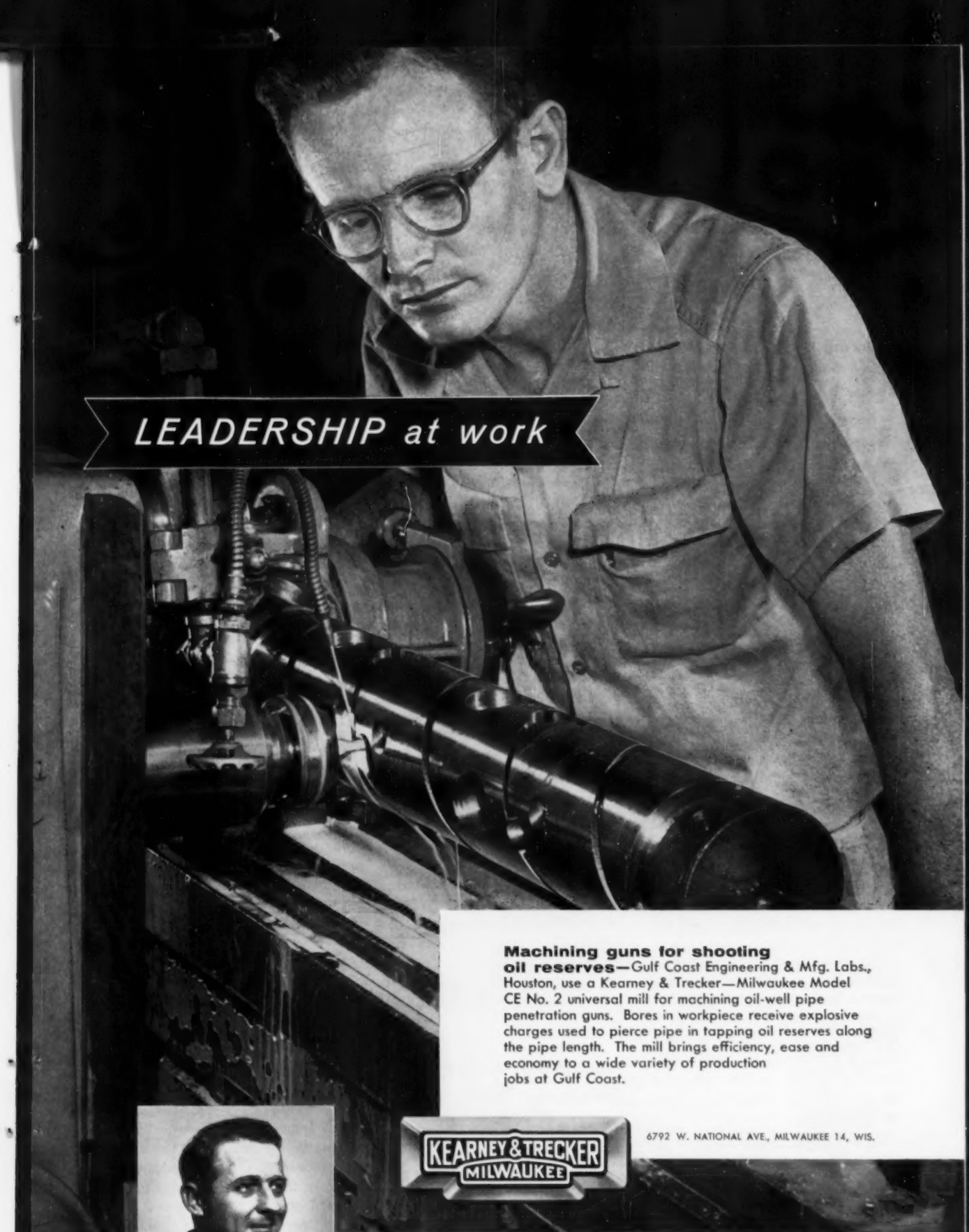
Supply Problems — "Naturally, we try to carry inventories as small as possible without running into excessive transportation charges or developing shortages of items at our plant," Mr. Compson says. "But this year we haven't always been successful."

For one thing, he admits, Ford and other automobile manufacturers entered the year with a larger inventory of steel, based on production rates, than is normal.

Delivery Disappointments—The lowered rate of steel production has posed some problems—and one of them, surprisingly, is delivery performance by steel suppliers. Mr. Compson explains that when mills operate on reduced schedules they only produce some items every four to six weeks.

"While we have a relatively high total inventory, we also have shortages of some items. We've got the first shortage book we have had in months. One item in the book is steel for wheel rims. A shipment was rejected. Unfortunately, the mill had completed processing that grade for the month and we have to wait for the next delivery—a month away."

HAROLD H. COMPSON: Always keep your buying policy consistent.



Machining guns for shooting oil reserves—Gulf Coast Engineering & Mfg. Labs., Houston, use a Kearney & Trecker—Milwaukee Model CE No. 2 universal mill for machining oil-well pipe penetration guns. Bores in workpiece receive explosive charges used to pierce pipe in tapping oil reserves along the pipe length. The mill brings efficiency, ease and economy to a wide variety of production jobs at Gulf Coast.

KEARNEY & TRECKER MILWAUKEE

6792 W. NATIONAL AVE., MILWAUKEE 14, WIS.

Kearney & Trecker's man on the job . . .

Allen Diener of Steel & Machine Tool Sales Co., Houston, aided Gulf Coast production executives in their selection of this K&T mill. *For expert milling counsel, call the K&T man near you. And remember to ask him, or write direct, for free comprehensive catalog.*

Kearney & Trecker staff photo by Ron Johnson

Great Lakes Cuts Base Prices

Detroit mill eliminates $2 price differential to meet local competition.

Other mills competing for automotive orders are expected to meet new Detroit prices.

▪ Great Lakes Steel Corp. has lowered its Detroit steel prices $2 per ton to meet local competitive conditions. The action eliminates the traditional differential in favor of Detroit area mills.

The price cut applies to all Great Lakes products, effective June 10. But it apparently was aimed principally at meeting the competition of McLouth Steel Corp., which has been charging $2 per ton less for cold-rolled sheets than have Great Lakes and other mills competing in the big automotive market.

The Background—Observers believe the price development means the elimination for all time of the Detroit area price differential. It was recalled that the Detroit differential once was $4 per ton. This was cut to $2 and held there until the current break.

The action also means that other mills selling to the auto firms will have to lower their delivered prices in Detroit in order to compete. U. S. Steel announced almost immediately that it would be competitive. Steel base prices in other areas of the country are expected to hold unchanged.

New Prices — New prices announced by Great Lakes include: Strip—hot-rolled $4.925, cold-rolled $7.15; high strength low alloy, hot-rolled, $7.325, high strength low alloy cold-rolled $10.50; alloy, hot-rolled, $8.10, cold-rolled $15.05. Sheets—hot-rolled 18 gauge and heavier $4.925, cold-rolled $6.05; high strength low alloy hot-rolled $7.275, high strength low alloy cold-rolled $8.975. Bars—carbon $5.425, reinforcing $5.425, alloy hot-rolled $6.475, high strength low alloy hot-rolled $7.925. Plates—carbon $5.10, alloy $7.20, high strength low alloy $7.625.

McLouth is expected to lower its hot-rolled sheet price to meet the new price announced by Great Lakes.

St. Louis Development—Granite City Steel Co. last week announced it was paring its area price differential in St. Louis from $4 to $2 per ton. This move came about because Granite City's price on truck shipments to St. Louis users was slightly higher than the delivered price of Chicago mills shipping into the area by barge. (The IRON AGE, June 5, '58, p. 174)

Sheet and Strip — June order books have been substantially fattened by hedge buying. Automotive tonnages have also been surprisingly good. The auto builders are balancing out inventories as they phase-out production on '58 models. A few orders for steel for '59 models have already come into Detroit area mills.

Pittsburgh mills report a modest improvement in cold-rolled orders. Some sheet facilities previously shut down in the **Cleveland** district are being reactivated to process June orders.

Plates—Situation varies by districts but plate sales in general are not being improved as much as sheet by hedge buying. One **Eastern** mill is cautious about accepting any more sheared plate orders for June shipment. Another describes the order book as a "day-to-day" affair, helped little by advanced buying.

Structurals—Supplies are much tighter in the **Midwest** than in **Pittsburgh** or along the **East Coast. Pittsburgh** mills are still taking orders for June shipment, but reaching the cutoff point. An **Eastern** supplier just reopened its structural mill following a shutdown. However, **Chicago** area mills are generally sold out on standard structurals for June and wide-flange beams for July.

Bar—Orders for bar are not being stimulated by price buying. June delivery is still available on hot-rolled bar in most areas. July orders are coming in slowly. Cold finishers are buying a little more hot-rolled bar from mills, indicating their inventories are thin.

Tinplate — The market shows little change, with June shipments from mills expected to about equal those of May. July is still a question mark with canners needs depending on the weather and the crop outlook.

Pipe and Tubing — Standard pipe, both buttweld and seamless, is benefiting from price hedge buying. Buttweld pipe distributors are stocking up heavily. Mills will be struggling to get all shipments out before the end of the month.

Oil country goods are still slow. But linepipe orders show some improvement.

PURCHASING AGENT'S CHECKLIST

Top management is paying more attention to inventory control. **P. 46**

Single-distributor machine tool show gets results. **P. 49**

Carefully catalogued die bank minimizes tooling costs. **P. 83**

COMPARISON OF PRICES

(Effective June 10, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	June 10 1958	June 3 1958	May 13 1958	June 11 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$10.30	$10.30	$10.30	$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.275
Light rails	6.50	6.50	6.50	6.25
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire Rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

	June 10 1958	June 2 1958	May 13 1958	June 11 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.97	$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cin'ti	73.87	73.87	73.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganese 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.49	$64.56
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$37.50	$33.50	$56.50
No. 1 steel, Phila. area	*33.50*	34.00	34.00	56.50
No. 1 steel, Chicago	*35.50*	36.50	36.50	51.50
No. 1 bundles, Detroit	28.50	28.50	24.50	46.50
Low phos., Youngstown	37.50	37.50	34.50	56.50
No. 1 mach'y cast, Pittsburgh	*47.50*	48.50	48.50	56.50
No. 1 mach'y cast, Phila.	47.50	47.50	47.50	56.50
No. 1 mach'y cast, Chicago	47.50	47.50	43.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$35.50*	$36.00	$32.67	$54.83
No. 2 bundles	*26.50*	26.83	23.83	46.33
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.38
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	95.125	94.50	94.75	98.375
Zinc, East St. Louis	10.00	10.00	10.00	11.00
Lead, St. Louis	*10.80*	11.30	11.80	13.80
Aluminum, virgin ingot	26.10	26.10	26.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. • Revised.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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KENCO 8-TON
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PUNCH PRESSES

...rugged, fast and trouble-free

They're Kenco-built with long-wearing parts *throughout* to eliminate downtime and give you *many extra* years of steady, low-cost production. Rigid, multiple-rib frames and extremely long ram ways assure high precision production. Driving mechanism engineered for trouble-free operation. Press is competitively priced.

Model 8-R—8-ton deep-throat, Rigid-Rib

Same construction features, but with 12¾" throat, and tremendous resistance to breakage, deflection, or torsional twist.

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KENCO MANUFACTURING CO.

5211 Telegraph Road, Los Angeles 22, California

Prices Weaken As Market Falters

Recent uptrend appears to be over. Present prices are sustaining current steel mill operations.

Some standoffs develop, but in general, dealers are willing to sell.

■ The recent market strength may have passed its peak. The major question now is how much of the gains will hold up.

Prices are shaky in some markets, particularly where recent gains were greatest. In other areas, expected strength failed to materialize, at least not to the extent of price increases.

The indications of weakness this week do not necessarily mean another collapse. The steel outlook is somewhat better, resulting in a better tone throughout the scrap market. But apparently current prices are strong enough to sustain the present steel operating rate.

One development is a strengthening of stainless scrap, with higher prices in Pittsburgh, New York and Detroit resulting.

In the openhearth market, both Chicago and Philadelphia faltered, with Pittsburgh just holding its own. Declines brought The IRON AGE No. 1 heavy melting Composite Price down from $36 to $35.50.

Pittsburgh—Prices of openhearth grades are holding as the latest market rise has definitely ended. Dealers are now willing to sell. Brokers say they can't buy any tonnage at reduced figures yet, but one consumer has dropped out of the market in anticipation of further weakness. Turnings are up $1 as outside prices continue to make local buying difficult. A buying flurry has boosted some stainless grades.

Chicago — The market buckled slightly under the combined pressure of mills seeking to hold the price line and brokers who are attempting to cover orders written in the past two weeks. Dealer resistance continues very firm, but small lots of scrap are moving at slightly reduced prices. Railroad lists continue very firm, cast is holding, and it is expected that all movement at reduced prices will continue in low volume. Industrial bundles dropped on basis of a late buy.

Philadelphia—The first domestic sale of heavy melting scrap in many weeks firmed the prices of these grades. An area mill bought limited tonnages of No. 1 heavy melting at $34 delivered, and No. 2 heavy melting at $30. Some No. 2 bundles were bought by the same mill at quoted prices. Export is slowing down to a trickle.

New York—Prices for steelmaking, blast furnace and cast grades are unchanged, although brokers are gloomy about chances for an order pickup in the near future. Stainless 18-8 solids are up $5 to a top of $150 on strength of buying of a Midwest mill. But other mills show little inclination to go along, are trying to stick at the $145 price.

Detroit — On the tail of last week's rise, dealers have changed their attitudes on predictions of reduced mill operating rates for July. The market is good, but not as strong as a week ago. No large drops in the price of scrap are expected.

Cleveland—Foundry market edged up this week, but steelmaking grades were weaker as mills shy away. Most have scrap for June sales spurt and apparently are waiting to see if July orders fall back. Dealers who helped fill a low priced foundry order last month were getting a break last week on a new order at $38.

St. Louis—Steel mills continue to operate at a higher rate (95.4 pct) and it is expected that this will continue through June. Receipts are said to exceed consumption. Rails are up $2 to $4 on purchases of railroad list.

Birmingham — Expected purchases failed to materialize and brokers list prices as unchanged, although there are no sales for actual price basing. There has been no buying for two weeks and a drop of $1 to $2 is anticipated by the trade.

Cincinnati — One area mill dropped its buying price $2 per ton on secondary grades taken on tie-in sales when the order was quickly filled. And not much was expected to move at newer prices as a new stand-off develops. Blast furnace grades are finding a good market in Cincinnati and up-river points.

Buffalo—A small tonnage of No. 2 grades was sold at quoted prices. Expected price increases failed to materialize. Although there is very little scrap moving into dealer yards, mill inventories remain high.

Boston—The market is firm, but there are no price changes for the third consecutive week. The atmosphere is much more encouraging to the trade than it has been recently.

West Coast—Big price prop is news of 15 cargoes for export starting in July. Inventories in dealers' yards are low. Only one major mill expects to buy through June.

BIG NEW
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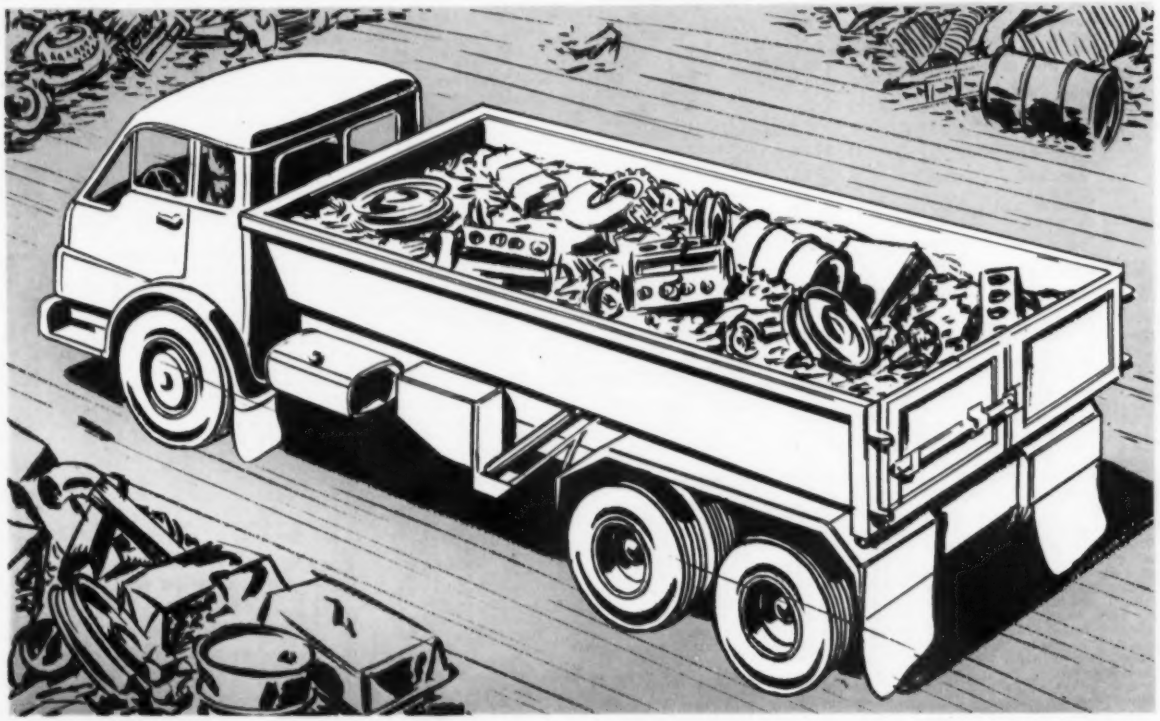

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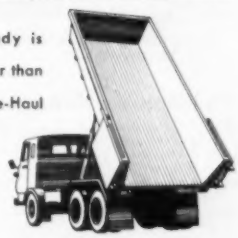

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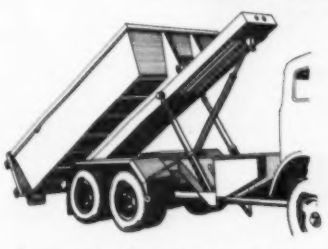

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EXPORT SALES: BORG-WARNER INTERNATIONAL CORPORATION, CHICAGO

SCRAP PRICES *(Effective June 9, 1958)*

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and ms. turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	40.00 to 41.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	53.00 to 54.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	175.00 to 185.00
18-8 turnings	105.00
430 bundles and solids	100.00 to 105.00
410 turnings	45.00

Chicago

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	46.00 to 47.00
Low phos. punch'gs plate	42.00 to 43.00
Low phos. 3 ft and under	40.00 to 41.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	47.00 to 48.00
Rerolling rails	54.00 to 55.00
Rails 2 ft and under	51.00 to 52.00
Locomotive tires cut	49.00 to 50.00
Cut bolsters & side frames	46.00 to 47.00
Angles and splice bars	50.00 to 51.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	38.00 to 39.00
Cast iron wheels	35.00 to 36.00
Malleable	51.00 to 52.00
Stove plate	38.00 to 39.00
Steel car wheels	43.00 to 44.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	90.00 to 95.00
430 bundles and solids	100.00 to 105.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	15.00 to 16.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Clean cast. chem. borings	24.00 to 25.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft and under	39.00 to 40.00
Low phos. punch'gs	39.00 to 40.00
Elec. furnace bundles	34.00 to 35.00
Heavy turnings	28.00 to 29.00
RR steel wheels	42.50 to 43.50
RR spring steel	42.50 to 43.50
Rails 18 in. and under	56.00 to 58.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	41.00 to 42.00
Malleable	58.00 to 59.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast.	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	12.00 to 13.00
Low phos, 18 in. and under	39.00 to 40.00
Rails, random length	43.00 to 44.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	45.00 to 46.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	24.50 to 25.50
No. 1 dealer bundles	32.50 to 33.50
No. 1 factory bundles	38.50 to 39.50
No. 2 bundles	21.50 to 22.50
No. 1 busheling	32.50 to 33.50
Machine shop turn	10.00 to 11.00
Mixed bor. and turn	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	38.00 to 39.00
Drop forge flashings	32.50 to 33.50
Low phos. punch'gs plate	33.50 to 34.50
Foundry steel, 2 ft & under	37.00 to 38.00
No. 1 RR hvy. melting	35.00 to 36.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	17.00 to 18.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	46.00 to 47.00
Stove plate	42.00 to 43.00
Malleable	58.00 to 59.00
Stainless	
18-8 bundles	160.00 to 165.00
18-8 turnings	85.00 to 90.00
430 bundles	75.00 to 80.00
430 turnings	30.00 to 35.00

Buffalo

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	26.00 to 27.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Low phos. plate	32.00 to 33.00
Structurals and plate, 2 ft and under	35.00 to 36.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
RR steel wheels	36.00 to 37.00
RR spring steel	32.00 to 33.00
RR couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	39.00 to 40.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	36.00 to 37.00
Rails, random lengths	45.00 to 46.00
Rails, 18 in. and under	50.00 to 51.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	51.00 to 52.00
RR specialties	41.00 to 42.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	35.00 to 36.00
Stove plate	38.00 to 39.00
Cast iron car wheels	36.00 to 37.00
Rerolling rails	53.00 to 54.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rails, random lgth.	43.00 to 44.00
Rails, 18 in. and under	47.00 to 48.00
Angles & splice bars	39.00 to 40.00
Rerolling rails	46.00 to 47.00
No. 1 cupola cast.	49.00 to 50.00
Stove plate	49.00 to 50.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	38.00 to 39.00

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	17.50 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	37.00 to 38.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	22.00 to
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	32.00 to 33.00
Charging box cast	31.00 to 32.00
Heavy breakable cast.	31.00 to 32.00
Unstripped motor blocks	22.00 to 23.00
Stainless	
18-8 prepared solids	145.00 to 150.00
18-8 turnings	45.00 to 50.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	28.00 to 29.00
Drop forge flashings	27.00 to 28.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Low phos. punch'gs plate	30.00 to 31.00
No. 1 cupola cast.	36.00 to 38.00
Heavy breakable cast.	26.00 to 27.00
Mixed cupola cast.	37.00 to 38.00
Automotive cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	75.00 to 80.00
430 bundles and solids	80.00 to 85.00
410 turnings	20.00 to 25.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	3.00 to 4.00
Mixed bor. and short turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	14.00 to 15.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	22.00 to 23.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	45.00

Los Angeles

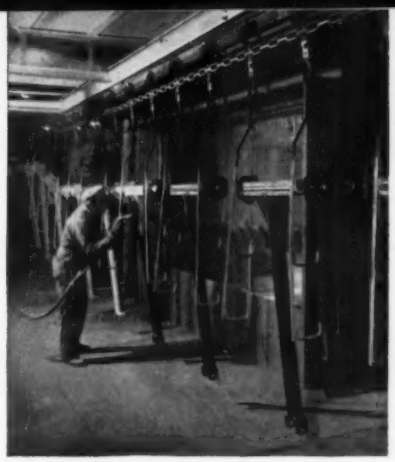
No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	$27.00 to 28.00
No. 2 bundles	17.00
Machine shop turn.	9.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Elec. furn 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	33.00
No. 1 cupola cast.	41.00 to 42.00

Seattle

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	20.00
Bush., new fact., prep'd	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	$45.00 to 50.00



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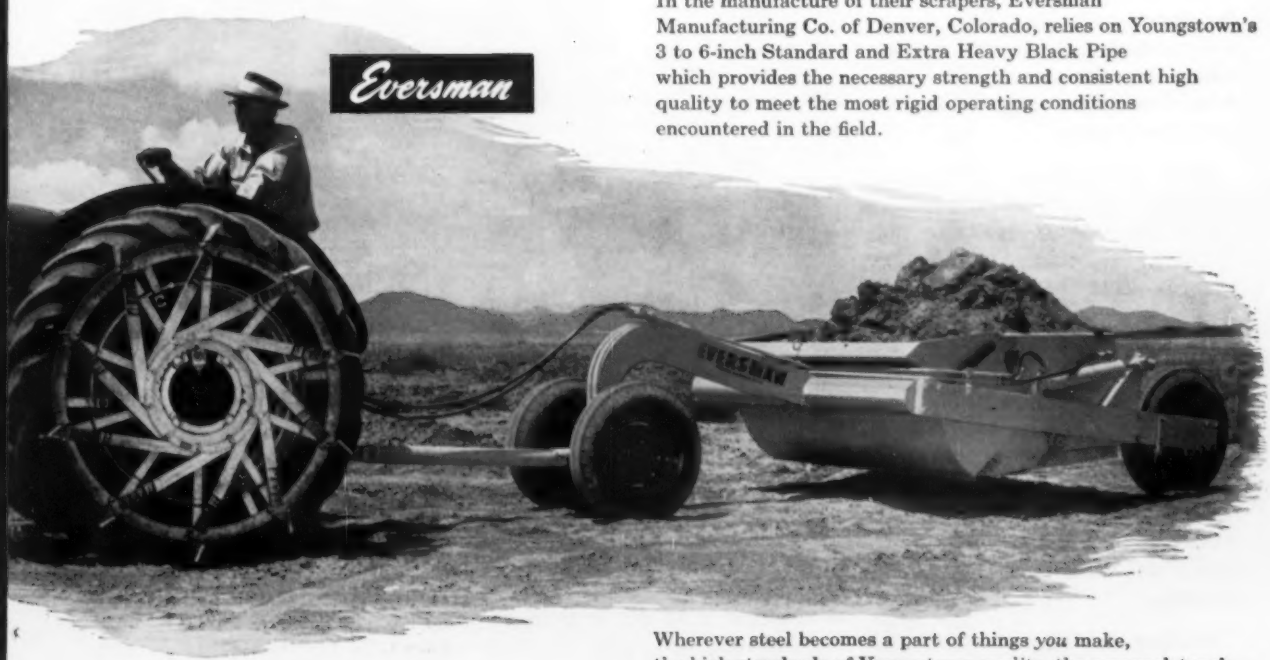
these tongue clevises produced from 3-inch Youngstown Standard Pipe, are being spray-painted prior to their assembly on finished scrapers.

Accent on Excellence

Youngstown standard pipe

Lucky is today's farm operator that has a new Eversman hydraulically-controlled scraper to handle most of his land-farming jobs. By simply hitching to a tractor, he can easily prepare his land for increased per-acre income in the future.

In the manufacture of their scrapers, Eversman Manufacturing Co. of Denver, Colorado, relies on Youngstown's 3 to 6-inch Standard and Extra Heavy Black Pipe which provides the necessary strength and consistent high quality to meet the most rigid operating conditions encountered in the field.



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Youngstown, Ohio

THE
YOUNGSTOWN
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Alcoa Asks Import Protection

The continuing recession is knocking more nonferrous companies off the import fence.

The latest: Alcoa's Wilmot says domestic aluminum industry must have protection to stay strong.

▪ Now that most nonferrous executives are conceding the recession isn't likely to end soon, more are coming off the fence on the issue of import competition.

A spot check indicates activity in both directions. Protectionists, those favoring government action to reduce the impact of imports on the domestic economy, seem to be making moderate gains. However, more than offsetting this is the Administration's stronger stand for more liberal trade.

Some Concessions—Washington observers hesitate about commenting on the outlook. But they do believe liberal trade sentiment is stronger, with action likely to be in this direction with some concessions to protectionists.

The latest to take a stand was Aluminum Co. of America. A sharp increase in mill product imports underselling U. S. items by 10 to 20 pct has prompted Alcoa to seek protection. Its first official statement was made to tariff opposition within the aluminum industry.

Bucking Subsidies — Donovan Wilmot, Alcoa vice president, told a meeting of independent aluminum extruders, "The primary industry must remain strong, and will find it increasingly difficult to do so unless government provides adequate protection for it against the competition of subsidized or state-owned foreign producers."

Aluminum Extruders Council president Leonard Starr announced his group's opposition to a higher tariff in a telegram to the House Ways and Means Committee, in May.

Some of the Alcoa executive's main points:

Little Reciprocity—There is no real reciprocity in our reciprocal trade agreements. On July 1, U. S import duty on aluminum will drop to 1.25¢ per lb. Several European countries still protect their aluminum industry to the tune of 6¢ to 10¢ per lb.

Foreign wages are far lower than in the U. S. The domestic aluminum industry pays an average wage of from $2.50 to $2.65 per hour, compared to 24¢ to 48¢ in such countries as Japan, Italy, France, and W. Germany.

Wages Climb—And he said that "unless the union can be persuaded to forego or defer it," wages will increase 25¢ per man per hour this summer.

"If some well considered action is not taken soon, American industry may cost itself out of business," Mr. Wilmot concluded. He made no reference in his plea for protection to the bill introduced by Rep. Howard Baker (R., Tenn.), to reimpose a 4¢ per lb tariff on aluminum pig and ingot.

Most notable nonferrous occupants of the "fence" are now Anaconda Co., and Kennecott Copper Co. And they are likely to stay there, say trade observers. Both have extensive interests both in the U. S. and Chile, stand to both gain on one hand and lose on the other no matter what happens.

Copper

Copper from custom smelters now costs the same as from producers—25¢ per lb. New custom smelters price, fifth ¼¢ boost in four weeks, is effective June 10.

The higher price is no surprise. Major smelters had said previous hikes had resulted in good business. But several had indicated some of this might be due to cost-conscious buyers switching some of their business from higher cost producers.

Now that the differential has been eliminated, further custom smelter moves might indicate some inventory rebuilding and a firming of the market.

Lead

Despite output cuts, unsold stocks at refineries continue to mount. Latest results: Major sellers cut their price ½¢ per lb, to 11¢ New York, 10.80¢ St. Louis.

Tin prices for the week: June 4—94.50; June 5—94.625; June 6—94.875; June 9—95.00; June 10—95.125.*
* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.00	26.00	4/1/58
Aluminum ingot	26.10	26.10	4/1/58
Copper (E)	25.00	27.00	1/13/58
Copper (CS)	25.00	24.75	6/10/58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	10.80	11.30	6/3/58
Lead, N. Y.	11.00	11.50	6/3/58
Magnesium ingot	38.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	185-200	200-250	4/1/58
Zinc, E. St. L.	10.80	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 136.

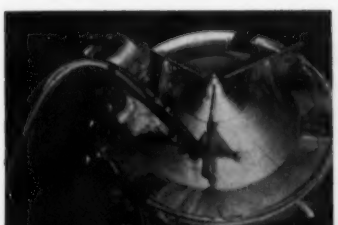
Take a new look at

TITANIUM

Tough to fabricate? Not today. With Mallory-Sharon's strict quality control and continuous research, titanium becomes a metal of uniform quality and predictable characteristics. It's being successfully machined, welded, formed to exacting specifications . . . in both aircraft and commercial applications.

Check the examples shown here... then contact us for technical data or assistance on your specific application.

For Machinability—*Improvements in the chemistry of titanium now permit it to be machined as readily as stainless steel. Mallory-Sharon guarantees a maximum of 0.1% carbon—an element that causes machining difficulties if present in higher proportions.*



For Weldability—*Commercially pure titanium and some titanium alloys can be arc welded with good results, provided weld area is protected from contamination by the surrounding atmosphere. Other satisfactory methods include spot, seam and flash welding.*

For Formability—*Titanium sheet as stretch-formed for jet engine pod. Since Mallory-Sharon titanium is certified in a definite strength range, spring-back is predictable and allowed for in dies. Fabricators report very low scrap loss with uniform strength material.*

For Technical Data—*Technical brochures are available through Mallory-Sharon on machining, welding and forming of titanium. Write us for literature on the process in which you are interested. Our strong Service Engineering group is available to assist you on specific applications*

MALLORY SHARON

MALLORY-SHARON METALS CORPORATION • NILES, OHIO

Integrated producer of Titanium • Zirconium • Special Metals

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	44.6	42.3	41.1	41.7
5052	52.0	46.9	45.2	44.4
6061-0	49.4	45.0	43.2	43.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	58.4-62.1
12-14	45.7-47.2	59.3-63.8
24-26	49.0-49.5	70.1-74.8
36-38	58.0-58.6	94.2-97.8

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	61.0	60.5	59.0	56.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade.. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Chot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13	.....	45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07	.....	41.38	50.48
Muntz Metal	45.19	.....	41.00	.....
Bomm. Bz.	46.98	47.52	46.92	49.54
Mang. Bz.	50.81	.....	44.91	.....
Phos. Bz. 5%	67.17	.....	67.67	.....

Free Cutting Brass Rod 31.03

TITANIUM

(Freight included in 5000lbs)

Sheet and strip, commercially pure, $8.50-$10.10; alloy, $15.95; Plate, HR, commercially pure, $6.00-$6.75; alloy, $8.75-$9.50. Wire, rolled and/or drawn, commercially pure, $6.50-$7.00; alloy, $10.00-$11.50; Bar, HR or forged, commercially pure, $5.25-$5.50; alloy, $5.25-$6.35; billets, HR, commercially pure, $4.10-$4.35; alloy, $4.10-$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadium, del'd ..... $ 1.55
Calcium,, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb).... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz..$2.25
Iridium, dollars per troy oz....$70 to $80
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $228 to $231
Nickel oxide sinter at Cooper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$19 to $21
Platinum, dollars per troy oz...$67 to $70
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 88.625
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 26.00
- No. 120 ..... 25.25
- No. 123 ..... 24.75

80-10-10 ingot
- No. 305 ..... 30.25
- No. 315 ..... 28.25

88-10-2 ingot
- No. 210 ..... 37.25
- No. 215 ..... 33.00
- No. 245 ..... 29.75

Yellow ingot
- No. 405 ..... 21.75

Manganese bronze
- No. 421 ..... 23.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.00-24.25
- 0.60 copper max. 23.75-24.00

Piston alloys (No. 122 type)..23.25-24.25
No. 12 alum. (No. 2 grade)...21.00-21.75
108 alloy 21.50-22.25
195 alloy 24.00-25.50
13 alloy(0.60 copper max.)...23.75-24.00
AXS-679 (1 pct zinc) 21.25-22.25

(Effective June 9, 1958)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.00-23.50
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.00-18.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20⅛
Yellow brass	16⅛	14½
Red brass	18⅝	17⅜
Comm. bronze	19¼	18½
Mang. bronze	14⅝	14⅛
Yellow brass rod ends	15⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21¾
No. 2 copper wire 20⅛
Light copper 17⅞
*Refinery brass 19¾
Copper bearing material 18¾
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21¾
No. 2 copper wire 20⅛
Light copper 17⅞
No. 1 composition 19
No. 1 comp. turnings 18½
Hvy. yellow brass solids 13½
Brass pipe 15
Radiators 15¼

Aluminum

Mixed old cast. ..... 11½—12
Mixed new clips ..... 14½—15½
Mixed turnings, dry ..... 12½—13½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 19 —19½
No. 2 copper wire ..... 17 —17½
Light copper ..... 15 —15½
Auto radiators (unsweated). 11½—12
No. 1 composition ..... 15½—16
No. 1 composition turnings.. 14½—15
Cocks and faucets ..... 12½—13
Clean heavy yellow brass ... 10½—11
Brass pipe ..... 12½—13
New soft brass clippings .... 13½—14
No. 1 brass rod turnings .... 11 —11½

Aluminum

Alum. pistons and struts .... 5 — 5½
Aluminum crankcases ..... 9 — 9½
1100 (2S) aluminum clippings 12½—13
Old sheet and utensils ..... 9 — 9½
Borings and turnings ..... 6 — 6½
Industrial castings ..... 9 — 9½
2024 (24S) clippings ..... 10½—11

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾ — 2
Old die cast scrap ..... 1½ — 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 6¾— 7
Battery plates (dry) ..... 2¼— 2½
Batteries, acid free ..... 1½— 1¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixer common babbitt ..... 9½—10
Solder joints ..... 13¼—13¾
Siphon tops 42
Small foundry type ..... 10½—10¾
Monotype ..... 10½—10¾
Lino. and stereotype ..... 9½— 9¾
Electrotype ..... 8½— 8¾
Hand picked type shells .... 6¼— 6¾
Lino. and stereo. dross ..... 2¼— 2½
Electro dross ..... 1¾— 2

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*		7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$98.50 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Owensboro, Ky.	$77.50 *G5*	$96.00 *G5*	$114.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*		5.275 *W3*	4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3* 9.20 *C1*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			4.925 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective June 9, 1958)

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.025 *G2*	6.15 *G2*	6.70 *G2*	6.725 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*	6.625 *T2*					6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

(Effective June 9, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*	»	7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.625 *L4*	
	Conshohocken, Pa.							5.10 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.65 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio	5.90* *R3*		7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,13*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,13, Y1*	5.425 *U1,13, Y1*	7.30 *R3,J3*	6.475 *U1,13, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,13, Y1*	6.175 *J3,13*	7.20 *U1,Y1*	7.625 *U1, Y1,13*	7.75 *M4*
	Granite City, Ill.							5.20 *G2*				
	Kokomo, Ind.		5.525 *C9*									7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Owensboro, Ky.	5.425 *G5*			6.475 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R5,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.75 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle, Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.425 *A8*									7.65 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.20 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective June 9, 1958) † Merchant Quality—Special Quality 35c higher. * Special Quality

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

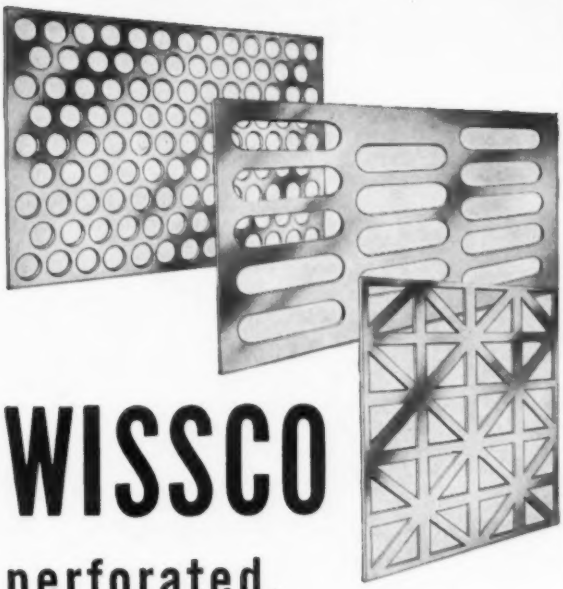
PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective June 9, 1958)



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popular designs . . . fast delivery

For over 60 years, users of perforated metals in varied industrial fields have been relying on Wissco to supply their perforated metals needs, dependably and swiftly.

Wissco Perforated Metals are readily available in many popular designs (rounds, slots and decorative) and materials (stainless and carbon steel, monel, copper, brass, bronze and aluminum) —to these specifications:

- **thicknesses from .003 to .375 inches;**
- **minimum hole sizes — .020 in brass and .027 in steel;**
- **staggered and straight row arrangements.**

For complete details, contact our nearest sales office.

In the East: **WICKWIRE SPENCER STEEL DIVISION**
Atlanta • Boston • Buffalo • Chicago • Detroit
New Orleans • New York • Philadelphia
In the West: **THE COLORADO FUEL AND IRON CORPORATION**
Denver and Oakland

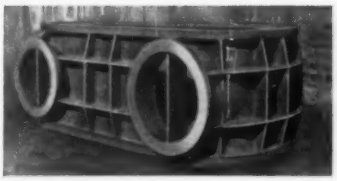
5703-A

CF&I **WISSCO**
PERFORATED METALS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

KUTZTOWN *Skill*

creates a WATER BOX CASTING

Photo shows completed Water Box (Dry Sand Molded) Casting in the rough. The overall dimensions, strengthening ribs, various outlets and the unusual curved internal channel were very accurately checked. Each of these details were held to within a standard tolerance.



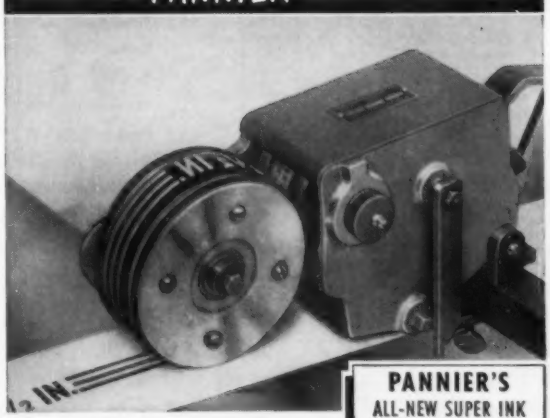
. . . from the making of the patterns to final inspection of the finished castings, Kutztown craftsmen follow procedures that assure DRY SAND MOLDED CASTINGS of the Highest Quality! For many years we have been molding medium to large castings in dry sand, molding them perfectly in large pits. Because they are so massive they are more efficiently and economically made in pits where there is no necessity for having large, cumbersome iron flasks.

Whatever your requirements in castings may be, we are certain that you will find Kutztown services more than adequate. Your inquiry is most welcome!

We'll be happy to place your name on our mailing list to receive regular issues of the "Kutztown REVIEW."

KUTZTOWN FOUNDRY & MACHINE CORP.
KUTZTOWN, PENNSYLVANIA

ANOTHER *PANNIER* MASTER MARKER!



Super Ink Print-All clearly marks all conveyed materials traveling horizontally or vertically. It prints top or bottom surfaces as material moves under or over the printer.

Write for complete data.

PANNIER'S
ALL-NEW SUPER INK
PRINT-ALL

Internally fed unit.
Use inks from semi-paste to liquid, including light colored, heavy pigmented inks.
Continuous or repeat printing.
No stopping to add ink.
Print on 1" centers with multiple staggered units.

BIRTHMARKED MATERIALS

MARKING MASTER PANNIER MARKERS **DEVICES**
THE PANNIER CORPORATION
206 Pannier Building • FAirfax 1-5185 • Pittsburgh 12, Pa.
Offices: Los Angeles • Chicago • Cleveland • Philadelphia • Birmingham

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over ..... 10.5¢
F.O.B. Riverton or Camden, New Jersey, west of Miss. River .... 9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River ..... 10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River ..... 9.5¢
Canadian sponge iron, del'd in East, carloads ..... 10.5¢
Atomized iron powder, 98% + Fe, 40 mesh,, F.O.B. Easton, Pa., in 100 lb bags ..... 7.7¢
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb. bags. Freight allowed east of Miss. River..... 10.5¢
Atomized iron powder, 98% + Fe. Cutting and scarfing grade, F.O.B. Easton, Pa. ..... 8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe .... 27.5¢
domestic 99.5+% Fe .... 36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe 57.0¢
Electrolytic iron melting stock, 99.84% pure ..... 27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe.. 88.0¢ to $2.85
Aluminum, freight allowed.. 38.00¢
Brass, 10 ton lots ..... 31.1¢ to 47.1¢
Copper, electrolytic ..... 41.50¢
Copper, reduced ..... 40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd ... $5.00
Lead, f.o.b. Hammond, Ind. . 19¢
Manganese f.o.b. Extron, Pa. 46.0¢
Molybdenum, 99% ..... $3.60 to $3.95
Nickel, chemically precipitated $1.05
Nickel, unannealed $1.00
Nickel, annealed $1.06
Nickel, spherical, unannealed #80 ..... $1.13
Silicon ..... 43.50¢
Solder powder .....13¢ plus met. value
Stainless steel, 302 ..... $1.02
Stainless steel, 316 ..... $1.30
Tin .....14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.15 (nominal)
Zinc, 5000 lb & over.....17.5¢ to 30.7¢

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
	Pct. Discounts			
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ⅜" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63
Rivets	
	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

Discount (Packages)
Full Finished H. C. Heat Treat

New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	8
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
⅝" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Quantity	Discount Mach. Screws	Discount Stove Bolts
Plain Finish Cartons		60	60
Bulk			
To ¼" diam. incl.	25,000-and over	60	..
5/16 to ½" diam. incl.	15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Discount Square
In Cartons		16	13
In Bulk			
⅜" diam. & smaller	25,000 and over	14	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Rolled elliptical, 18 in. or longer, 5000 lb lots 40.00
Electrodeposited 31.25
Brass, 80-20, ball anodes, 2000 lb or more 44.00
Zinc, ball anodes, 2000 lb lots 16.00
(for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225
(Rolled depolarized add 3¢ per lb)
Cadmium 1.55
Tin, ball anodes $1.13 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 68.70
Copper sulphate, 100 lb bags, per cwt. 22.15
Nickel salts, single, 100 lb bags.... 40.50
Nickel chloride, freight allowed, 300 lb 48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 24.05
(Philadelphia price 24.50)
Zinc cyanide, 100 lb 60.75
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 10,000 lb or more 31.00

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

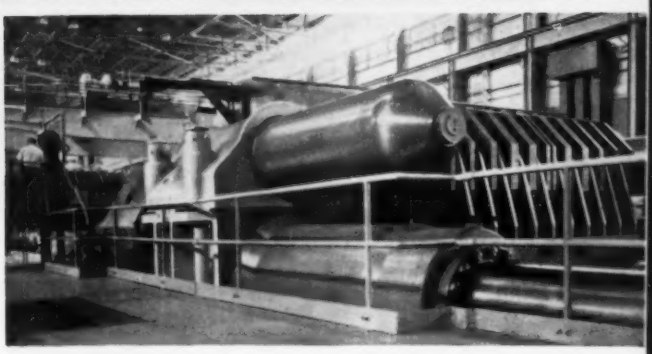
Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (18 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	10.69*	16.28	15.28	19.83	19.08
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	16.38	15.38	19.93	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.15*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.25	8.69	9.00	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.35	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.29	18.69
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		7.10	8.05	.....	7.25	8.05	7.25	7.20	11.10	16.20	15.25	19.65	18.95
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles		9.70**	9.50	11.80	8.80	8.85	8.70	8.75	12.10*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12 11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.93	14.93	19.48	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	16.19	15.19	19.74	18.99
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	10.02	8.79	8.87	8.66	8.75	11.61*	16.11	15.11	19.66	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.89	14.89	19.35	18.60
Portland		10.00[1]	11.75[2]	13.30[3]	11.95[4]	10.10[5]	11.10[6]	9.85[7]	11.34*	18.50	17.45	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.05	17.15	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.60	9.94	10.61	8.74	9.08	9.25	9.12	9.56	16.16	15.16	19.71	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 gn. x 36" x 120"; [2] 20 ga. x 36" x 120"; [3] 26 ga. x 30" x 96"; [4] 1⅛" x 1" in lots of 1000 to 9999; [5] sheared plate ¼" x 84" in lots of 1000 to 9999; [6] 3" x 5.70" in lots of 1000 to 9999; [7] M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective June 9, 1958)

8000-ton plate stretcher-leveller as seen from the cylinder end and stationary grip head. Movable grip head is in rear.



8000-ton plate stretcher-leveller as seen from the cylinder end, operator's side.

Huge Loewy stretcher-leveller is only one in world that can handle plate up to 152 in. wide

In 1947 Loewy-Hydropress built an 825-ton-capacity stretcher-leveller for heavy plate—world's largest. Ever since, Loewy engineers have paced the field. Recently they put an 8000-ton model into operation at Alcoa's Davenport, Iowa, plant—in hardly more than a decade they had developed one 10 times as powerful as the giant of 1947. Over 160 ft. long and weighing more than 5,500,000 lb., this machine can grip in its massive jaws rolled aluminum plate up to 152 in. wide, 95 ft. long, and 6 in. thick, stretch-straightening it with a pull of 16,000,000 lb.

Loewy stretcher-levellers are pushbutton operated by one man. Uneven and severely warped plates and sheets of aluminum, carbon steel, stainless steel, nickel-clad steel, and other materials are straightened to fault-free flatness and smoothness within seconds. During stretching the material is stressed beyond its yield point. This equalizes the stress over the entire cross-section and prevents warpage and distortion during later machining operations, while simultaneously improving physical properties.

Loewy-Hydropress will build stretcher-levellers for plate and sheet and stretcher-straightener-detwisters for rod and sections in all sizes and capacities, from 100 to 8000 tons, even to much higher capacities if required.

Write us at Dept. A-6 if you would like to know more about these powerful auxiliaries to rolling mills and extrusion presses in which Loewy specializes.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2

High-carbon chromium . . .925 D-3, D-5
Oil hardened manganese .475 O-2
Special carbon 36 W-1
Extra carbon 36 W-1
Regular carbon 305 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	S. $25	6.50	6.975	.....	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	14.75
So. Chicago *R3*	.....	.....	.....	9.75	.....	.....	.....
Ensley *T2*	S. $25	6.50	.....	.....	.....	.....	.....
Fairfield *T2*	.....	6.50	.....	9.75	.....	6.60	.....
Gary *U1*	S. $25	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	S. $25	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B3*	S. $25	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	S. $25	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B3*	S. $25	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

Furnace, beehive (f.o.b.) Net-Ton
Connellsville, Pa. . . . . $15.00 to $15.75
Foundry, beehive (f.o.b.)
$17.50 to $19.00

Foundry oven coke
Buffalo, del'd $31.75
Detroit, f.o.b. 30.50
New England, del'd 31.55
Kearney, N. J., f.o.b. 29.75
Philadelphia, f.o.b. 29.50
Swedeland, Pa., f.o.b. 29.50
Painesville, Ohio, f.o.b. 30.50
Erie, Pa., f.o.b. 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b. 29.75
St. Louis, f.o.b. 31.50
Birmingham, f.o.b. 28.85
Milwaukee, f.o.b. 30.50
Neville, Is., Pa. 29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

Gross Ton
Openhearth lump $12.70
Old range, bessemer 11.85
Old range, nonbessemer 11.70
Mesabi, bessemer 11.60
Mesabi, nonbessemer 11.45
High phosphorus 11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.625	.....
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor	.....	12.10	.....
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55	Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*) $2 a ton higher; Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
8	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) $135.00
No. 1 Ohio 120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill. 120.00
No. 2 Ohio 103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00) 21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $150.00
Childs, Hays, Pa. 155.00
Chicago District 160.00
Western Utah 175.00
California 180.00
Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 157.00-160.00
Silica cement, net ton, bulk, Latrobe 28.50
Silica cement, net ton, bulk, Chicago 25.50
Silica cement, net ton, bulk, Ensley, Ala. 26.50
Silica cement, net ton, bulk, Mt. Union 24.50
Silica cement, net ton, bulk, Utah and Calif. 37.00

Chrome Brick

Per net ton
Standard chemically bonded, Balt. $105.00
Standard chemically bonded, Curtiner, Calif. 115.00
Burned, Balt. 99.00

Magnesite Brick

Standard Baltimore $131.00
Chemically bonded, Baltimore 116.00

Grain Magnesite

St. ⅝ to ½-in. grains
Domestic, f.o.b. Baltimore in bulk. $73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite

Per net ton
F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.75
Midwest 17.00
Missouri Valley 15.00

(Effective June 9, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire ¢/lb.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	8.65	9.20
Aliquippa *J3***	173	190	...	...	198	8.65	9.325
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	175	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4***	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dav. *M4***	175	192	...	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	...	212	193	8.65	9.20
Duluth *A5*	173	187	...	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	...	212	193	8.65	9.20
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	...	219	203	9.00	9.675
Johnstown *B3***	173	190	172	...	196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	...	212	193	8.65	9.20
Kokomo *C9**	175	189	...	214	195*	8.75	9.30*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	...	217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	8.65	9.20
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*†	.....	.....	.....	236	.....	9.60	10.15†
SparrowsPt. *B3***	175	.....	.....	214	198	8.75	9.425
Sterling, Ill. *N4***	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	8.95	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50			.....
Birmingham *W9*	62.00	62.50*	66.50		.....
Birmingham *U4*	62.00	62.50*	66.50		.....
Buffalo *R1*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50		.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Menessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*, McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*, Bridgeville, Pa., *U2*; Detroit, *M2*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1* Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown; *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

(Effective June 9, 1958)

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GUARANTEED RE-NU-BILT
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	Elliott		475	320
1	2250	Elliott		600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1300
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
3	800	G.E.	MCF	250	400/750
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
2	200	Whse.	CB-207.4	250	850/1200
2	125	Whse.	SK-190	230	450/1200
1	150	G.E.	CDBB	600	250/700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350/1050
2	100	Whse.	SK-181	230	450/1000
1	75	G.E.	CD-1231	230	850
1	50	G.E.	MD-412-AE	230	850
6	40	Rel.BB	385FTEFC	230	500/1500
1	1500	Whse.		525	600
7	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300-720
1	750	G.E.	MCF	600	120/360

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2500/4600
1	1500	G.E.	600	600	4160/2300
2	1000	G.E.	720	600	6600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	Whse.	900	125/250	440
1	500	G.E.	900	125/250	440/2300
1	350	G.E.	900	125	4160/2300/440
2	300	G.E.	1200	250	2300
1	250	Whse.	1200	275	2300
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800 x 83/55
3	500	Kuhl	OISC	1	13200 x 6600
3	500	Moloney	OISC	1	6600/11430Y x 2300/4000Y
1	225	Marcus	Auto-air	3	208/220
Unused					
3	150	G.E.		1	33000/2300/4000Y
3	100	Whse.	OISC	1	4600/2300 x 460/230/115
3	100	G.E.	OISC	1	22900 x 2400/160Y
Unused					

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Pittsburgh Dealers Still Optimistic

Used machinery sellers there waiting for pickup which may not come until late Fall.

Meanwhile they're cheered by small sales spurts and belief slowdown has finally reached the bottom.

▪ Pittsburgh dealers are looking for a pickup. There has been no general improvement in orders, but they are encouraged by spot flurries of business, by predictions of a general recovery, and by signs that the bottom has been reached.

"I'm buying heavily," says one supplier. "Equipment is readily available and prices are right, and things have to get better. They can't get any worse."

Mill Equipment — Suppliers of steel mill equipment report a slight upturn. The gain comes from buyers outside the basic steel and aluminum industries. There is still a demand for small mills to be used in rolling special metals on a development basis. Mills range from 10 to 20 in. wide. They are single stand units, geared to low quantity production.

In addition export activity continues. One dealer recently shipped to Europe a single stand, four-high cold mill for rolling sheet up to 48 in. wide.

Supplies Not Ample—Stocks of steel mill equipment are not excessive. One supplier has been able to reduce inventory this year, moving several auxiliary units that had been in stock throughout 1957. The mills are not dumping equipment on the market. There are no distress sales and prices are holding firm.

With the summer lull about to hit, dealers say it will be November 1 before there is a real upsurge. However, they expect to be able to scramble along.

"There is still business to be had if you go out and look for it," says one.

Waiting for Spark—A supplier of cranes, conveyors, and other types of materials handling equipment feels the bottom point has been passed. The rate of inquiries indicates plants are starting to activate capital spending programs. There is still a general hesitancy, however; everyone is waiting for the spark that will start business upward.

A supplier of electrical equipment felt a pickup in orders two weeks ago. Inquiries have now tapered off. There doesn't seem to be any pattern to the buying of motors and generators by steel mills. They were ordering heavily when the ingot rate was at its low point. Now ingot production is climbing and they have stopped placing orders.

Machine Tools Slow—Electrical suppliers are disturbed by the price cutting of new equipment manufacturers. Suppliers and distributors are being squeezed hard as factory representatives offer big discounts on direct sales.

Machine tools are sharing in the general lull. Inquiries have picked up according to one dealer but orders are coming in slowly. There is plenty of equipment available but there are still a few spot shortages. Tool room lathes under 14 in. and over 36 in, are plentiful. Lathes in the medium range—18 to 24 in.—are still scarce.

CONSIDER GOOD USED EQUIPMENT FIRST

BALER
Model #122-PX-60 Logemann, Bailing Chamber 60 x 14 x 18"
BENDER & STRAIGHTENER
Pels Type JH All Steel Bender & Straightener for Beams, Channels, Angles, Tees—Angles Equal & Tees 8 x 8 x 1⅛"
BENDING ROLLS
8' x ¾" Bertsch Initial Type
12' x 5/16" Bertsch Initial Type
16' x ⅜" Ransome Pyramid Type
20' x ½" Niles Pyramid Type
BRAKES—PRESS TYPE
500 ton Pacific Hydraulic, 10' Bet. Housings
10' x ¼" & 12' x ¼" Hydraulic—NEW
CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton J&H	56' Span 220/3/60
5 ton Shepard Niles	70' Span 230 Volt D.C.
7½ ton Shaw	40' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton P&H	39' Span 230 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Northern	54' Span 230 Volt D.C.
15 ton Shepard Niles	56' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine
FORGING MACHINES
1" to 5" Acme, Ajax, National
FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell
HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.
HEADERS
#44 Waterbury Farrel DS OD, Capacity 5/16"
#250C Manville SS SD, Capacity ¼"
LEVELERS—ROLLER
37" Torrington, 19 Rolls 1 31/32" dia.
44" Newboldt, 9 Rolls 4" dia.
60" Aetna Standard, 17 Rolls 4⅜" dia.
MILLING MACHINE—PLANER TYPE
42" x 42" x 14' Ingersoll 2 Rail & 2 Side Heads
PRESSES—HYDRAULIC
600 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes 36" Stroke, 48 x 45" Bet. Cols.
1000 ton HPM Fastraverse, Bed 48" x 74", 36" Stroke
1500 ton Mesta Steam Hydr. Forging Press
PRESS—KNUCKLE JOINT
No. 25 Bliss 600 ton, 2½" Stroke, Bed 24" x 29"
PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 35½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44" x 38"
250 ton Bliss S1 7½ Str. Blstr. 32" x 39"
PUNCH & SHEAR COMBINATIONS
Buffalo #1½ Ironworker
Cleveland Style C; Arch Jaw, Capy. ⅜" x ⅜"
Cleveland Style EF, Arch Jaw, Capy. 1¼" x 1"
ROLLING MILLS
6" x 1" Three Stand Wire, Rolling Mill Complete with Pay Off & Recoiler
6" x 5" Torrington Flat Wire Mill Line
8" x 10" Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High
ROLL—FORMING
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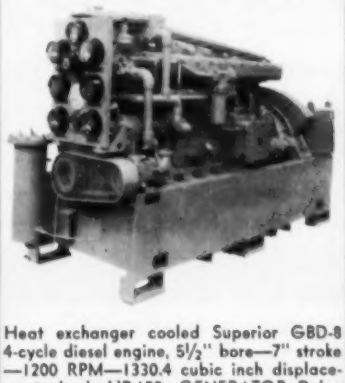

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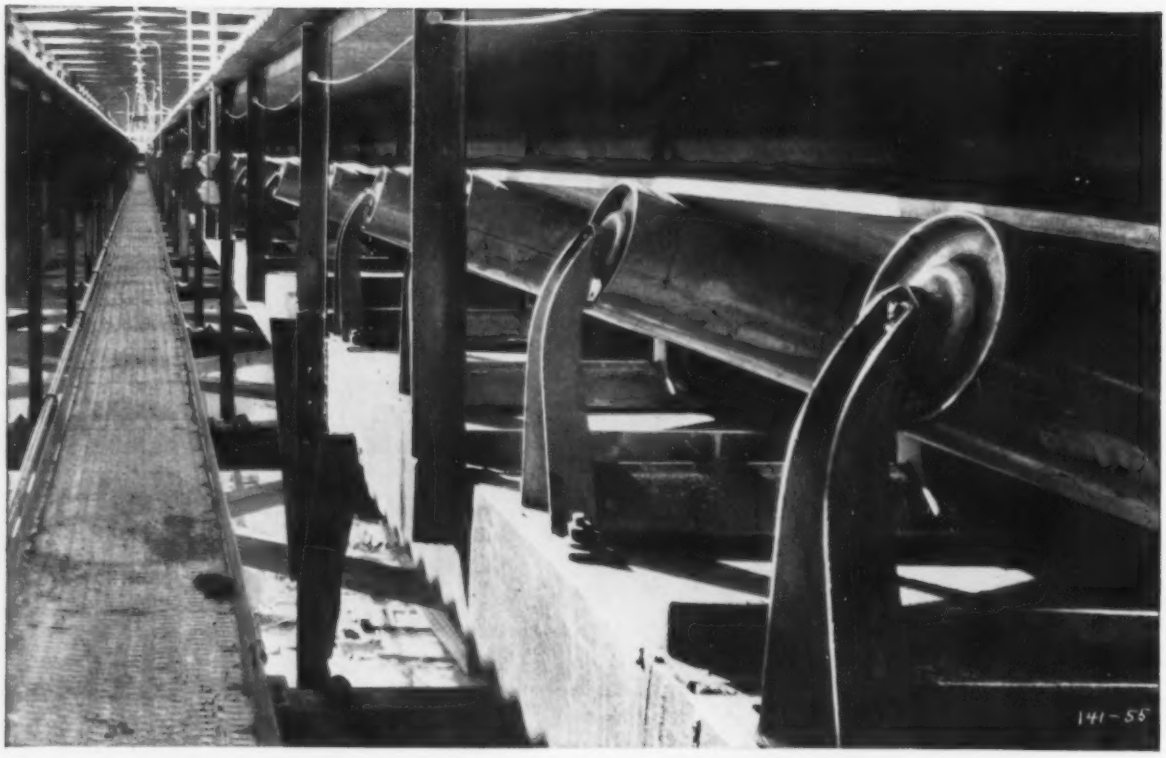

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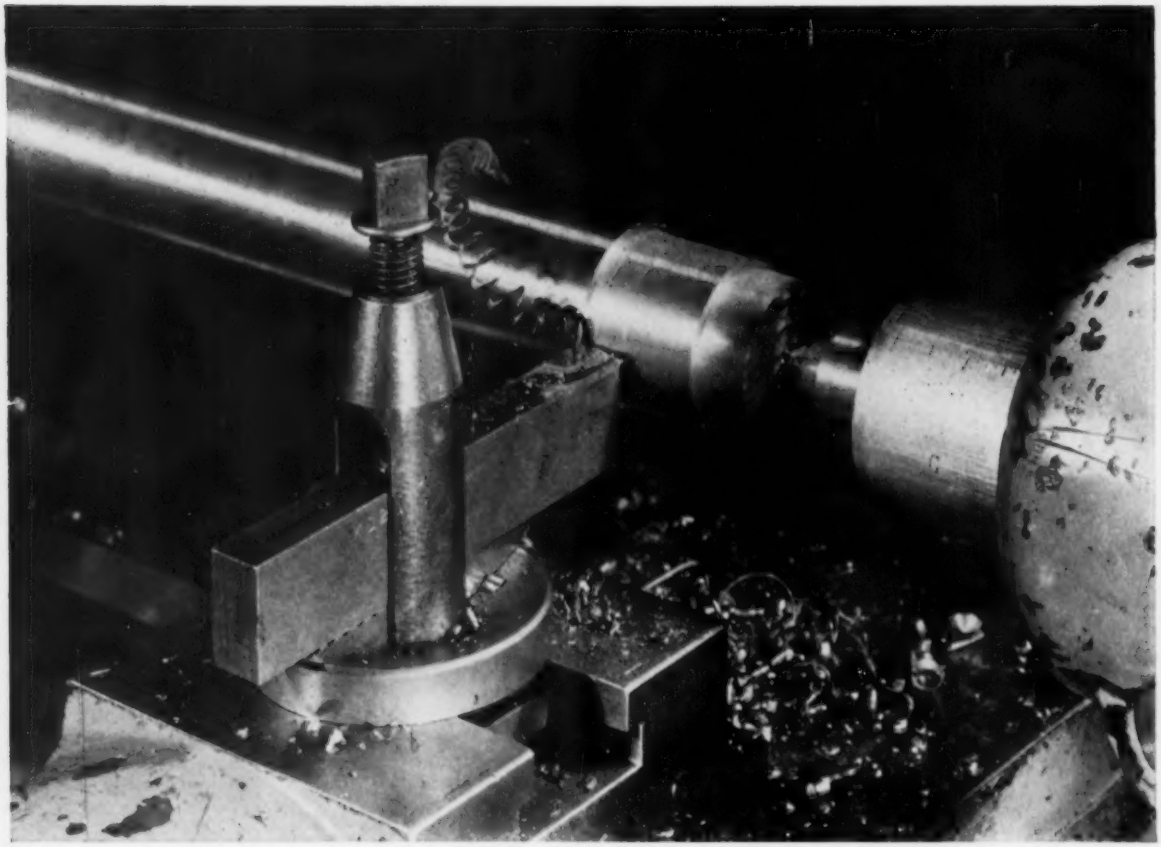

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